Index to NASA Tech Briefs

1974



February 1975

National Aeronautics and Space Administration

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Introduction

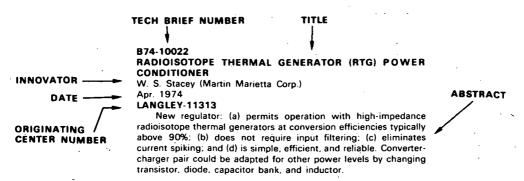
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This *Index to NASA-Tech Briefs* contains abstracts and four indexes—subject, personal author, originating Center, and Tech Brief number—for 1974 Tech Briefs.

Abstract Section

The abstract section is divided into nine categories: Electronics/Electrical; Electronic/ Electrical Systems; Physical Sciences; Materials/Chemistry; Life Sciences; Mechanics; Machinery, Equipment, and Tools; Fabrication Technology; and Computer Programs. Within each category, abstracts are arranged sequentially by Tech Brief number.

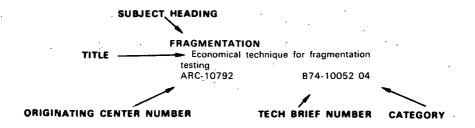
A typical abstract entry has these elements:



The originating Center number in each entry includes an alphabetical prefix that identifies the NASA Center or Atomic Energy Commission office where the Tech Brief originated. A list of prefixes and the corresponding Center names are given on page iii.

Indexes

Four indexes are provided. The first is a subject index, arranged alphabetically by subject heading. Each entry in the subject index includes a Tech Brief number and a category number to aid the user in locating pertinent entries in the abstract section.



The preliminary edition of the NASA Thesaurus (December 1967) (NASA SP-7030) is used as the authority for the indexing vocabulary that appears in the subject index. The NASA Thesaurus should be consulted in examining the current indexing vocabulary, including associated cross-reference structure. Only the subject terms that have been selected to describe the documents abstracted in this issue appear in the subject index. Copies of the NASA Thesaurus may be obtained from the National Technical Information Service or the U.S. Government Printing Office at \$8.50 for the three-volume set. The first two volumes of this Thesaurus, consisting of the alphabetical listing of subject terms (A-Z), have been superseded by the following single-volume publication: NASA Thesaurus Alphabetical Update (September 1971) (NASA SP-7040), available from NTIS for \$6.00. (Volume III of the Preliminary Edition consists of the following ancillary aids to vocabulary selection: hierarchical display of index terms, category term listing, permuted index, and a listing of postable terms only.)

The second index is a personal author index. Entries in this index are arranged alphabetically by author's name. Tech Brief and category numbers are supplied to help the user find the appropriate entries in the abstract section.



The third index relates each originating Center number to the corresponding Tech Brief number and category. Entries in this index are arranged in alphanumeric order by Center number.



The fourth index relates each Tech Brief number to its originating Center number. Entries are arranged in ascending Tech Brief number order.



Originating Center Prefixes

NASA

ARC	Ames Research Center
ERC	Electronics Research Center
GSFC	Goddard Space Flight Center
HQ	NASA Headquarters
KSC	Kennedy Space Center
LANGLEY	Langley Research Center
LEWIS	Lewis Research Center
M-FS	Marshall Space Flight Center
MSC	Johnson Space Center (formerly Manned
•	Spacecraft Center)
NPO	NASA Pasadena Office
XAC	Ames Research Center
XLA	Langley Research Center
	•

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Index to NASA Tech Briefs

February 1975

Abstract Section

01 ELECTRONICS/ELECTRICAL

B74-10006

HIGH VOLTAGE SOLID-STATE RELAY

B. L. Sater, T. J. Riley, and W. A. Janssen (Sterer Eng. and Mfg. Co.) $\,$

Mar 1974 See also NASA-TM-X-68248

LEWIS-12096

Hybrid microelectronics relay has characteristics significantly superior to conventional solid state relays. Relay provides 2500 Vdc input to output isolation and operates from high threshold logic signal to switch load of 400 Vdc at 2 mA. Technology should be of interest to manufacturers of discrete components.

B74-10015

LOW COST INSTRUMENTATION AMPLIFIER

J. C. Sturman

Jun. 1974

LEWIS-12222

Amplifier can be used for many applications requiring high input impedance and common mode rejection, low drift, and gain accuracy on order of one percent. Performance of inexpensive amplifier approaches that of some commercial instrumentation amplifiers in many specifications.

B74-10026

RADIATION HARDENING OF METAL-OXIDE SEMICON-DUCTOR (MOS) DEVICES BY BORON

V. Danchenko

Apr. 1974

GSFC-11425

Technique using boron effectively protects metal-oxide semiconductor devices from ionizing radiation without using shielding materials. Boron is introduced into insulating gate oxide layer at semiconductor-insulator interface.

B74-10047

THREE-POINT BRIDGE CALIBRATION WITH ONE RESISTOR

D. R. Harrison and R. M. Brown

May 1974

ARC-10762

Method calibrates transducer bridge curing unbalanced condition and line resistance errors are negligible. Series resistance method can be automated easily and controlled by 2-bit information source which provide 4 states for switches.

B74-10064

ELECTROMETER SYSTEM MEASURES NANOAMPS AT HIGH VOLTAGE

J. C. Sturman, G. R. Sharp, R. R. Robson, N. J. Stevens, D. H. F. Priebe, and R. G. Wetli (Boeing Co.)
Jul. 1974

LEWIS-12267

Floating electrometer eliminates major source of error since any leakage from electrometer case, which is at high voltage, appears only as load on high voltage supply and not as part of current being measured. Commands to and data from floating electrometer are transferred across high voltage interface by means of optical channels.

B74-10068

ROTATING TURBINE BLADE PYROMETER

D. R. Buchele and D. J. Lesco

Aug. 1974 See also NASA-TM-X-68113

LEWIS-12218

Non-contacting pyrometer system optically measures surface temperature distribution on rotating turbine blade, comprising line-by-line scan via fiber optic probe. Each scan line output is converted to digital signals, temporarily stored in buffer memory, and then processed in minicomputer for display as temperature.

B74-10069

SELF-PROTECTING SOLID STATE ISOLATED SWITCH

A. C. Hoffman and S. T. Gooder

Aug. 1974

LEWIS-12268

Solid state switch has following capabilities: (1) Hybrid or IC from compatible with direct mounting on solar array substrate; (2) Continuous signal is not required to hold it in either on or off state; (3) Separate signal lines for on and off control; (4) Electrically isolated from input signals; and (5) Current surges will not cause switch failure.

B74-10079

VERY HIGH VOLTAGE LATCHING RELAY

R. R. Lovell, N. J. Stevens, and D. D. Renz

Aug. 1974

LEWIS-12265

Relay consists of high voltage reed switch actuated by rotating permanent magnet mounted on stepper motor shaft, with actuation assembly isolated from high voltage circuit. Unit can be modified for use as double pole or double pole double throw latching relay and can be used in either air or vacuum.

B74-10089

PIEZOELECTRIC RELAY

D. H. Fryklund (Accumetrics Corp.)

Aug. 1974

GSFC-11627

Bimorph configurations reduce sensitivity to shock and vibration and yet respond to weak electric fields. Two bimorphs provide sum of individual movements, simulating double length.

B74-10090

EFFICIENCY INCREASED IN NEW SOLAR CELL: A CONCEPT

J. A. Hutchby

Aug. 1974

LANGLEY-11174

Graded band-gap cell should be able to convert solar radiation into electrical energy more efficiently than any solar cell currently available. Thickness of band-gap region should be chosen to maximize both quantity of light absorbed in region and fraction of photogenerated charge carriers collect at junction.

B74-10100 THIN-FILM TEMPERATURE SENSOR J. Maserjian and J. R. Gatewood Aug. 1974 NPO-11775

Sensor measures rapid temperature changes in fluid streams. Sensor withstands contacts with various corrosive fluids, high fluid-flow rates, and turbulences caused by rapid changes in flow rates. Capacitor is part of resonant bridge circuit which produces ac voltage that is proportional to temperature.

B74-10107 IMPROVED SOLID-STATE TRIODE CONSTRUCTION A. Shumka Aug. 1974 NPO-13064

Triode is constructed from rectangular filament made of near-intrinsic n-type silicon. Collector and emitter are formed on opposite faces of filament and are spaced approximately 0.13 mm apart. Gate electrodes are alloyed to filament and extend longitudinally along midsection of other two opposite sides, approximately 0.06 mm apart.

B74-10110 INTEGRATED STRUCTURE VACUUM TUBE: A CONCEPT J. Dimeff and W. J. Kerwin (Univ. of Ariz.) Aug. 1974 ARC-10445

Cathode emission is made to occur by heating entire structure to 600 C, and positive potential is applied to anode with negative potential on grids. Electron flow takes place from ring to circular anode through electric field produced by grids.

B74-10112 BIO-ISOLATED DC OPERATIONAL AMPLIFIER R. D. Lee Aug. 1974 ARC-10596

Possibility of shocks from leakage currents can be reduced by use of isolated preamplifiers. Amplifier consists of batterypowered operational amplifier coupled by means of light-emitting diodes to another amplifier which may be grounded and operated from ac power mains or separate battery supply.

B74-10120 DECIMAL DIGIT GENERATOR FOR COMMUTATED DATA: A CONCEPT

S. J. Rusk (Lockheed Missiles and Space Co.) Aug. 1974 . . . ARC-10856

Perform analog-to-digital conversion on input signal with staircase circuit having 10% resolution, convert digital result to analog voltage, subtract it from original input signal; read out feedback signals as decimal digit representation during one clock phase and servo-error difference between input and feedback as analog portion during following clock phase.

B74-10160 POCKET GAUGE FOR CHECKING INSERT CLOCKING OF MULTIPIN CIRCULAR CONNECTORS E Billinguage

E. Billmeyer Sep. 1974 NPO-11924

Prototype gauge has been constructed of heavy clear plastic with engrayed degree lines, numerals, and alignment lines. With-suitable modification, gauge can be mass produced. It could be marketed directly to users or to manufacturers of circular multipin connectors.

B74-10180 MINIATURE BIAXIAL STRAIN TRANSDUCER I. S. Hoffman

Oct. 1974

LANGLEY-11648

Transducer is completely reusable and permits relocation to alternate points to be accomplished quickly. Size permits measurements to be made simultaneously over small areas and yields outputs directly proportional to strains measured. Transducer verifies elastic modulus, Poisson's ratio, and principal strain axes on materials.

B74-10192 MICROELECTRONICS PACKAGING TECHNIQUE: A CONCEPT

E. J. Stringer (Rockwell Intern. Corp.)
Nov. 1974

MSC-19399

Plug-in flat packs and flat conductor cable (FCC) can be used to make compact, lightweight, external monitoring system requiring minimum of hard-wiring. Microelectronic monitoring panel includes replaceable integrated or hybrid circuit flat packs

B74-10196 HEART-RATE PULSE-SHIFT DETECTOR

M. Anderson (Northrop Corp./Electronics Div.) Nov. 1974

ARC-10729

and FCC.

Detector circuit accurately separates and counts phase-shift pulses over wide range of basic pulse-rate frequency, and also provides reasonable representation of full repetitive EKG waveform. Single telemeter implanted in small animal monitors not only body temperature but also animal movement and heart rate.

B74-10197 REFERENCE APPARATUS FOR MEDICAL ULTRASONIC TRANSDUCER

R. D. Lee, R. J. Hudock, and D. I. Shute Nov. 1974

ARC-10753

Once reference apparatus has been located properly, and its position on chest of patient has been recorded on skin by means of indelible fiducial marks, it is simple matter at later time to reposition probe on chest over heart. In this way, signals from exact same area of heart can be re-examined.

B74-10209 INTERPLEX MODULATION AND A SUPPRESSED CARRIER TRACKING LOOP FOR COHERENT COMMUNICATIONS SYSTEMS

S. Butman and U. Timor Nov. 1974

NPO-11572

Simple addition to hardware and new mode of operation of transmitter and receiver in coherent, PCM/PSK/PM configuration greatly improves channel efficiency. Procedure reduces amount of power lost to intermodulation products.

B74-10234

A METHOD FOR POLYCRYSTALLINE SILICON DELINEA-TION APPLICABLE TO A DOUBLE-DIFFUSED MOS TRANSISTOR

J. L. Halsor (Westinghouse Elec. Corp.) and H. C. Lin (Westinghouse Elec. Corp.)

LANGLEY-11536; LANGLEY-11598

Method is simple and eliminates requirement for unreliable special etchants. Structure is graded in resistivity to prevent punch-through and has very narrow channel length to increase frequency response. Contacts are on top to permit planar integrated circuit structure. Polycrystalline shield will prevent creation of inversion layer in isolated region.

B74-10239 IMPROVED CIRCUIT BOARD INTERCONNECTORS

J. H. Martin (Charles Stark Draper Lab., Inc.) Dec. 1974

MSC-12661

One component serves three functions, electrical interconnections, thermal control, and mechanical integrity, at same time. Several versions of design: (1) Insulated support plate contains holes; (2) Alternate support plate configuration uses rivets instead of pins; and (3) Another configuration includes leaf-spring contacts instead of pins or rivets.

B74-10242 HIGH-VOLTAGE DISTRIBUTORS

J. F. McChesney, Jr. Dec. 1974

GSFC-11849

Two distributors reduce high-voltage breakdowns and corona discharges. Both distributors are constructed to prevent air traps and facilitate servicing without soldering. Occurrence of coronas is also minimized due to smooth surfaces of device.

B74-10251

PHASED-ARRAY ANTENNA PHASE CONTROL CIRCUIT USING FREQUENCY MULTIPLICATION

R. J. Mailloux and P. R. Caron

Jan. 1975

ERC-10285

Circuit separates out, from multiplied signals, antenna element signals which have desirable phase angles and feeds them to appropriate antenna elements of phased array. System may be used in either transmitting or receiving mode.

B/4-10253 Self-protected electrodes limit field-emission Current

W. L. Lees Jan. 1975 ERC-10015

One cathode includes array of square-shaped conductor columns. Columns are electrically interconnected by conducting plate on bottom. Each column provides field-emission current. Another cathode includes array of rodlike conductors. Layer is covered by control film made of conducting material. Film is isolated from each conductor.

B74-10255 AMPLITUDE-STEERED, PSEUDOPHASED ANTENNA ARRAY

C. C. Johnson, R. J. Martel (Westinghouse), F. J. Dietrich (Philco Ford Corp.), and G. J. Koloboff (Philco Ford Corp.)

Jan. 1975

GSFC-11446

Beam may be smoothly scanned around ring array without instantaneous phase transitions while maintaining constant radiated power by gradually transferring power from receding element to element next to leading edge of driven segment, and by accomplishing antenna element switching during intervals when no power is being applied to elements being switched.

B74-10256 SYNCHRONIZED FREQUENCY TRANSPOSER

J. F. Sutton Jan. 1975

GSFC-11763

Transposer operates entirely in analog domain. Input analog signal is serially loaded into analog register at rate determined by voltage-controlled oscillator. At same time, signal is serially unloaded from other register at expanded time rate determined by divider output feeding through switch.

B74-10257 BIDIRECTIONAL ZOOM ANTENNA

R. F. Schmidt

Jan. 1975 See also B74-10041

GSFC-11862

Antenna comprises two parabolic cylinders placed orthogonally to each other. One cylinder serves as main reflector, and

the other as subreflector. Cylinders have telescoping sections to vary antenna beamwidth. Beamwidth can be adjusted in elevation, azimuth, or both. Design has no restriction as to choice of polarization.

B74-10258

OPTICAL COMMUNICATION CHANNEL SIMULATOR SYSTEM

M. W. Fitzmaurice and M. Tycz Jan. 1975

GSFC-11877

Optical transmission link is simulated by positioning linear optical modulator between optical carrier source and receiver for carrier. Optical modulator is driven by analog signal, derived from analog computer circuit, having random variations indicative of characteristics of transmission link.

B74-10259

COLOR-CODED AREA SENSITIVITY MAPS OF PHOTOMUL-TIPLIERS

O. Youngbluth, Jr.

Jan. 1975 LANGLEY-10320

Technique was devised specifically for testing photomultipliers and other photodetectors, but it could also be used to color code any type of mapping data, such as weather or topographical maps, thermal or pressure distributions on reentry surfaces, or any other three-dimensional data to be displayed in two-dimensional form.

B74-10260

HORN ANTENNA WITH V-SHAPED CORRUGATED SURFACE

F. B. Beck, C. A. Mentzer (Ohio State Univ.), and L. Peters, Jr. (Ohio State Univ.)

Jan. 1975 See also NASA-CR-2317

LANGLEY-11112

Corrugated shape is easily machined for millimeter wave application and is better suited for folding antenna designs. Measured performance showed "V" corrugations and rectangular corrugations have nearly the same pattern beamwidth, gain, and impedance. Also, "V" corrugations have higher relative power loss

B74-10262

DEPOSITING SPACING LAYERS ON MAGNETIC FILM WITH LIQUID PHASE EPITAXY

J. W. Moody (Monsanto Res. Corp.), R. W. Shaw (Monsanto Res. Corp.), and R. M. Sanfort (Monsanto Res. Corp.)

Jan. 1975 See also NASA-CR-2413

LANGLEY-11528

Liquid phase epitaxy spacing layer is compatible with systems which are hard-bubble proofed by use of second magnetic garnet film as capping layer. Composite is superior in that: circuit fabrication time is reduced; adherence is superior; visibility is better; and, good match of thermal expansion coefficients is provided.

B74-10274

DIGITAL SECOND-ORDER PHASE-LOCKED LOOP

J. K. Holmes, C. Carl, and C. R. Tagnelia Jan. 1975

NPO-11905

Actual tests with second-order digital phase-locked loop at simulated relative Doppler shift of 1×0.0001 produced phase lock with timing error of 6.5 deg and no appreciable Doppler bias. Loop thus appears to achieve subcarrier synchronization and to remove bias due to Doppler shift in range of interest.

B74-10280

RELIABILITY DATA FOR ELECTRONIC AND ELECTRO-MECHANICAL COMPONENTS: A REPORT

W. R. Scott

Jan. 1975

NPO-13153

Ten classes of parts covered in report: capacitors, crystals,

01 ELECTRONICS/ELECTRICAL

diodes, fuses, inductors, microcircuits, relays, fixed resistors. transformers, and transistors. Each class is contained in separate section and includes discussion of inherent failure modes, screening rationale, general screening requirements, derating criteria, and stress-analysis data.

B74-10281

STRAIGHT-LINE IC REMOVAL TOOL

R. A. Marzek and W. S. Read Jan. 1975

NPO-13157

Tool operates by applying force perpendicularly to socket plane. Tool can be operated in cramped or confined quarters and can effect integrated circuit removal without damage. It may also be useful to hold nut or bolt in confined space while tightening, when it is not possible to use conventional tool.

B74-10282

DC-TO-AC INVERTER RATIO FAILURE DETECTOR

T. J. Ebersole (GE) and R. E. Andrews (GE)

Jan. 1975 NPO-13160

Failure detection technique is based upon input-output ratios, which is independent of inverter loading. Since inverter has fixed relationship between V-in/V-out and I-in/I-out, failure detection criteria are based on this ratio, which is simply inverter transformer

LOW-LOSS, CIRCULARLY-POLARIZED DICHROIC PLATE

turns ratio, K, equal to primary turns divided by secondary turns.

R. T. Woo and A. Ludwig

Jan. 1975

NPO-13171

Dichroic plate has orthogonally-disposed, loaded dipole apertures with their orientations arranged so as to cancel cross-coupling effects which would otherwise result in power loss to circularly polarized signal.

MICROMETEOROID VELOCITY-AND-TRAJECTORY ANA-LYZER

S. O. Auer (Natl. Acad. of Sci.)

Feb. 1975

GSFC-11889

By adding potential energy of charged capacitor to kinetic energy of impacting particle, new technique causes major fraction of atoms in microscopic particle impacting on particle-receiving surface to be ionized. Chemical constituents of impacting particle are represented by generated ion mass spectrum in approximately correct proportions.

MICROMETEOROID COMPOSITION ANALYZER

S. O. Auer (Natl. Acad. of Sci.)

Feb. 1975

GSFC-11892

Technique has been developed to detect moving charged particles and to determine their positions and/or their velocity vectors, relative to three mutually orthogonal axes, without particle impact or any elements of detector and without changing particle charge or motion.

B74-10290

ALINEMENT FIXTURE FOR PRECISION CUTTING OF PRINTED-WIRING BOARDS

M. L. Holliday

Feb. 1975

LANGLEY-11658

Six alinement templates are used to trim-cut majority of boards fabricated. Their use has reduced time required for cutting operation and has also reduced high rejection rate of cut boards to near zero.

B74-10294

IMPROVED FABRICATION OF ELECTROLYTIC CAPACI-TORS

F. J. Gamari (Sprague Elec. Co.) and J. L. Moresi (Sprague Elec. Co.)

Feb. 1975

M-FS-23133

After processing parts for assembly, insulative cup is fitted to bottom of can, then electrolytic solution consisting of white sulfuric acid gel is inserted into can. Pellet is put in can and is fitted tightly into cup. Finally, bead weld is formed between can and header plug.

B74-10295

STABLE GROUP DELAY CABLE

P. A. Clements

Feb. 1975

NPO-13138

It was found that group delay is function of pressure in air dielectric coaxial cable. For example, 600-ft air dielectric cable will change phase 10 deg at 150 MHz when air pressure in cable changes from zero to 20 psi.

02 ELECTRONIC/ELECTRICAL SYSTEMS

B74-10004

SELF-HEALING FUSE

N. D. Jones (GE), R. E. Kinsinger (GE), and L. P. Harris (GE)

Mar. 1974 See also NASA-CR-121244

LEWIS-11964

Fast-acting current limiting device provides current overload protection for vulnerable circuit elements and then re-establishes conduction path within milliseconds. Fuse can also perform as fast-acting switch to clear transient circuit overloads. Fuse takes advantage of large increase in electrical resistivity that occurs when liquid metal vaporizes.

B74-10021

DATA PROCESSOR WITH CONDITIONALLY SUPPLIED **CLOCK SIGNALS**

R. J. Lesniewski

Apr. 1974

GSFC-10975

Parallel data processor clock pulses are conditionally supplied to processing unit in response to relative values of binary bit of control source and binary bit derived on single lead. Use of single lead simplifies fabrication of large-scale integrated networks.

TRAFFIC CONTROL SYSTEM AND METHOD

C. R. Laughlin, R. C. Hollenbaugh, and W. K. Allen

Apr. 1974

GSFC-10087

Frequency of carrier received by aircraft is measured and compared with reference to indicate magnitude of Doppler shift. One Doppler frequency range is selected and indicated by digital signal. Difference between frequency is offset of apparent carrier frequency transmitted by aircraft.

B74-10025

LOW-DISTORTION RECEIVER FOR BILEVEL, BASEBAND **PCM WAVEFORMS**

G. E. Proch (Lockheed Electron. Co.)

Apr. 1974

MSC-14557

Digital receiver improves discrimination between information signals and noise and provides order to magnitude reduction in systematic distortion. Receiver combines advantages of bandlimiting prefilter and high-amplitude thresholds to provide asynchronous discrimination between information signals and spurious signals.

B74-10035

HIGH Q BAND-PASS RESONATORS UTILIZING COM-POSITE BAND-STOP RESONATOR PAIRS

H. C. Okean (AIL Div., Cutler-Hammer Corp.) Jul. 1974

GSFC-10990

Resonator pairs are formed of composite series- or parallelconnected transmission-line elements, which are exclusively quarter-wavelength half-wave-length lines. Resonator elements are constructed with microstriplines in parallel planes separated by dielectric. Striplines of coaxial transmission lines can be used in construction also.

B74-10041 VARIABLE-BEAMWIDTH ANTENNAS R. F. Schmidt

Jul. 1974

GSFC-11760

Two effective designs have been developed for Cassegrain and Gregorian antenna configurations. Each provides for both high-gain and low-gain operations. Cassegrain system sacrifices some efficiency due to small amount of increased spillover loss. Gregorian system provides for independent spillover control with two feeds.

B74-10050 HIGH-DIRECTIVITY ACOUSTIC ANTENNA

H. M. A. EL-Sum (EL-Sum Consultants)
May 1974 See also NASA-CR-114636
ARC-10789

Acoustic antenna with unique electronic steering control is used to identify and define aerodynamic noise sources in free field, particularly in wind tunnel which is quite reverberant. Provision is made for high directivity as well as improved discrimination against unwanted background noise such as reverberation or echoes.

B74-10078 FAIL-SAFE FIRE DETECTION SYSTEM

E. T. Bloam Aug. 1974

LEWIS-12238

Fire detection control system continually monitors its own integrity, automatically signals any malfunction, and separately signals fire in any zone being monitored. Should be of interest in fields of chemical and petroleum processing, power generation, equipment testing, and building protection.

B74-10083 ELECTRONIC HIGH PASS FILTER

V. S. Peterson and I. G. Hansen

Aug. 1974

LEWIS-11600

Ultra accurate filter is used with static type pressure transducers where it is desirable to extract low frequency dynamic signals from combined static and dynamic signal. System can be calibrated at any time with dc voltages.

B74-10086

A LOW COST "AIR MASS 2" SOLAR SIMULATOR

K. Yass, H. B. Curtis, and P. Harlamert, Jr. Sep. 1974 See also NASA-TM-X-3059

Tungsten halogen projection lamps have integral ellipsoidal reflector, and hexagonal shaped plastic Fresnel lenses. Reflector is dichroic coated to reduce infrared content of reflected radiation. Array of lamps and lenses produces uniform collimated beam having near AM2 spectrum and intensity that can be used for testing flat plate solar collectors.

B74-10088

TIME-CONTROL SYSTEM FOR COMMUNICATION BETWEEN DATA-COLLECTION AND ORBITING

C. W. Kurvin (Radiation, Inc.)

Aug. 1974

GSFC-11182

Platform design includes timers which limit data transmission to times when satellites are within radio communication range. As result of reduced power requirement, data-collection platforms now can be equipped with significantly lighter battery packages.

B74-10093

GENERALIZED CURRENT DISTRIBUTION RULE

M. A. Tapia (Ga. Inst. of Tech.)

Aug. 1974

LANGLEY-11565

Method helps determine branch current in parallel-series network in relation to total input current by inspection. Method is particularly useful for circuits with many elements when branch elements are described as admittances. If element values are variables, then these values may be expressed as admittances to find currents readily in desired branches.

B74-10097

POCKET-SIZE MICROWAVE RADIATION HAZARD DETECTOR

R. B. Kolbly

Aug. 1974

NPO-11461

Inexpensive lightweight unit is easily carried in coat pocket or attached to belt, detector sounds alarm in presence of dangerous microwave radiation levels. Unit consists of antenna, detector, level sensor, keyed oscillator, and speaker. Antenna may be single equiangular spiral or set of orthogonal slot dipoles. Signal detector is simple diode in small package.

B74-10098

FREQUENCY DISCRIMINATOR/PHASE DETECTOR

R. B. Crow Aug. 1974

NPO-11515

Circuit provides dual function of frequency discriminator/phase detector which reduces frequency acquisition time without adding to circuit complexity. Both frequency discriminators, in evaluated frequency discriminator/phase detector circuits, are effective two decades above and below center frequency.

B74-10099

FACILITY FOR TESTING SOLAR CELLS

R. K. Yasui

Aug. 1974

NPO-11761

Primary components of facility are test chamber and external solar simulator. Voltage--current performance characteristics of solar cells at various combinations of temperature and light intensity are plotted on X-Y recorder. Data are fed into computer for calculation of maximum power, curve shape factor, cell efficiency, and averages of each parameter.

B74-10104

THIRD-ORDER PHASE-LOCKED LOOP RECEIVER

R. B. Crow and R. C. Tausworthe

Aug. 1974

NPO-11941

Third-order extension to present second-order systems extends their Doppler tracking capabilities. It widens receiver pull-in range, decreases pull-in time, lowers voltage-controlled oscillator (VCO) noise (determining when no signal is present), and lessens susceptibility to VCO drift.

B74-10106

TEMPERATURE COMPENSATION OF DIGITAL INERTIAL SENSORS

P. J. Hand

Aug. 1974

NPO-13044

Heaters for thermal stabilization are unnecessary when analog dc voltage provided by gyroscope temperature sensor is used to change outputs to compensate for temperature variations. Sensor is normally installed on all precision gryoscopes.

02 ELECTRONIC/ELECTRICAL SYSTEMS

R74-10109

FAST SIGNAL AVERAGER

T. N. Cornsweet (Stanford Res. Inst.)

Aug. 1974

ARC-10090

Electron beam of cathode ray tube with fast phosphor is intensity-modulated by input signal to produce repetitive horizontal trace of luminous intensity proportional to time-varying signal strength. Horizontal trace of cathode ray tube occurs so repetitive portion of signal of interest is encompassed within its length.

B74-10115

ANALYSIS OF ORBITAL HEAT TRANSFER

T. Buna (Martin Marietta Corp.)

Aug. 1974

ARC-10842

Radar mapping of planets can be accomplished at lower cost and with reduced emphasis on propulsion system capability from spacecraft operating in elliptical orbit than from circular orbit.

B74-10137

ANTI-MULTIPATH DIGITAL SIGNAL DETECTOR

J. H. Painter

Sep. 1974

LANGLEY-11379

Detector operates in conjunction with radio frequency portion of receiver to detect digital signals transmitted in known modulation formats. Signal is constructed by assigning known and distinct modulation waveforms to sequence of message symbols. It reconstructs transmitted digital sequence with minimum probability that any reconstructed digit will be in error.

R74-10142

MAGNETOMETER WITH MINIATURE TRANSDUCER AND **AUTOMATIC TRANSDUCER SCANNING APPARATUS**

R. A. Breckenridge, W. J. Debnam, Jr., C. L. Fales, and A. V. Pohm (Iowa State Univ.)

Sep. 1974

LANGLEY-11617

Magnetometer is simple to operate and has fast response. Transducer is rugged and flat and can measure magnetic fields as close as 0.08 mm from any relatively flat surface. Magnetometer has active region of approximately 0.64 by 0.76 mm and is capable of good spatial resolution of magnetic fields as low as 0.02 Oe (1.6 A/m).

ERROR-CORRECTING CODES FOR HIGH-SPEED DIGITAL COMPUTERS

R. D. Campbell (Sperry Rand Corp.)

Sep. 1974

M-FS-22887

Published document discusses method for correcting errors. According to this method, computer operation becomes faulttolerant, i.e., its operation is error-free in spite of single hardware element malfunction. Also, method provides for detection and correction of repetitive and spurious processing and transmission errors

B74-10150

CLOSED-CIRCUIT-TELEVISION WELDING-ELECTRODE **GUIDANCE SYSTEM**

H. E. Smith, D. L. Stephens, R. A. Taylor, W. A. Wall, R. M. Avery, and H. P. Wunsch (Hayes Intern. Corp.)

Sep. 1974

M-FS-23026

Closed-circuit TV camera is mounted parallel to electrode and moves along with it. Camera is scanned along seam so seam is viewed parallel with scan lines on TV monitor. Two fiber optics illuminators are attached to guidance system; they illuminate seam for TV camera.

B74-10158

IMPROVED THERMAL ISOLATION FOR SUPERCONDUCT-ING MAGNET SYSTEMS

E. R. Wiebe Sep. 1974

NPO-11875

Closed-cycle refrigerating system for superconductive magnet and maser is operated in vacuum environment. Each wire leading from external power source passes through cooling station which blocks heat conduction. In connection with these stations, switch with small incandescent light bulb, which generates heat, is used to stop superconduction.

B74-10162

IMPROVED CAPACITANCE MULTIPLIER CIRCUIT

A. J. Kline, Jr. (Motorola, Inc.)

Sep. 1974

NPO-11948

Circuit multiplies capacitance without increasing overall circuit gain. In addition, circuit may be designed to include lag or lead/lag transfer function and independent gain adjustment.

B74-10163

MINICOMPUTER-CONTROLLED FREQUENCY GENERATOR

R. A. Winkelstein

Sen 1974 NPO-11962

Extremely-accurate and low-phase-noise frequency generator varies oscillator frequency as predetermined function of time. System could be used: (a) to automatically vary transmission frequencies in accordance with seasonal and diurnal changes in ionospheric conditions, (b) as automatic tuner for heterodyne receivers, or (c) as control element for phase-locked telemetry receivers.

B74-10165

ADVANCED-PRIORITY INTERRUPT MODULE

H. L. Jeane

Sep. 1974

NPO-13067

Module contains mask register, line register, primary sync register, secondary sync register, push-pop stacking register, control section, and interrupt address generator. APIM operates in conjunction with logic found in majority of minicomputers to provide fully-vectored interrupt capabilities.

B74-10170

CONTINUOUS FOURIER TRANSFORM SYSTEM R. M. Munoz

Sep. 1974 ARC-10466

Complex digital computer is not required, only summing amplifiers and attenuators are used for transformation of signal. Continuous transform system may be used for spectrum analysis, filtering, transfer function synthesis, and communications.

B74-10171

G-LOAD INDICATOR AND WARNING DEVICE FOR **AIRCRAFT**

J. C. Howard

Sep. 1974

ARC-10806

Device facilitates pilot control of g-load maneuvers and provides immediate indication of g-load constraint violations. It may be used in test flights, in aircraft simulators, or in displays of performance of remotely piloted aircraft.

B74-10176

MAGNETIC-HEADING REFERENCE DEVICE

H. D. Garner

Oct. 1974 See also NASA-TN-D-7460

LANGLEY-11387

Inexpensive and reliable device is used in conjunction with fluidic-electronic wing-leveler system. Single magnetometer is placed so pilot can make adjustments in aircraft heading simply by rotating magnetometer itself.

B74-10178

WIDE DEVIATION PHASE MODULATOR

R. H. Couch, C. P. Hearn, and L. R. Wilson (LTV Aerospace Corp.)

Oct. 1974

LANGLEY-11607

Modulator produces phase-modulated waveform having high modulating linearity. Technique is inherently wideband with respect to carrier frequency and can operate over decade carrier frequency range without adjustments. Circuit performance is both mathematically predictable and highly reproducible.

B74-10191 REDUCTION OF QUANTIZATION ERROR IN MEASURE-MENT OF FREQUENCY

E. J. Nossen (RCA) and E. R. Starner (RCA)

Nov. 1974

MSC-14649

Method reduces quantization errors using new digital circuit. Circuit provides very high resolution (10 to the minus 2nd power to 10 to the minus 3rd power Hz) without high-speed counters. It lends itself to microminaturization and is simple to construct. Unknown frequency is compared to standard frequency by means of zero-crossing coincidence-detecting circuit.

B74-10198

SPACECRAFT ATTITUDE DETERMINATION BY FANSCAN TECHNIQUE

H. A. Lassen (TRW Systems Group, TRW, Inc.) and J. H. Decanini (TRW Systems Group, TRW, Inc.)

Nov. 1974

ARC-10827

To determine orientation, or attitude, of spacecraft in flight relative to data-receiving antenna on earth use fanbeam antenna which is offset in angle from spin axis of spacecraft and provides fan-like radiation pattern.

B74-10250

IMPROVED CIRCULARLY POLARIZED ANTENNA

L. C. Van Atta and R. J. Mailloux

Jan. 1975

ERC-10214

Antenna includes two sets of linearly polarized elements. Each set contains slots in parallel array. Sets are mutually orthogonal and are driven in phase quadrature. By changing lengths of slots or their separations, antenna beamwidth can be changed over wide range. Similar results are achieved with dipole configuration.

B74-10276

NEGATIVE ION SPECTROMETRY FOR DETECTING NI-TRATED EXPLOSIVES

H. G. Boettger and J. Yinon

Jan. 1975

NPO-13082

Ionization procedure is modified to produce mainly negative ions by electron capture. Peaks of negative ions are monitored conventionally. Nitrated organic materials could be identified directly from sample sniff inlet stream by suitably modified mass spectrometer because of unique electronegativity which nitro group imparts to organic material.

B74-10277

FULL-FLOW FLUID FILTER

L. R. Toth and R. Hagler, Jr.

Jan. 1975

NPO-13118

Etched-disk filter was developed with fluid passageways in configuration which allows relatively unrestricted flow of fluid and has stagnation areas for collection of impurities. In addition, filter housing without center post was developed to improve flow characteristics.

TELECOMMUNICATIONS SYSTEMS DESIGN TECHNIQUES **HANDBOOK**

R. E. Edelson, J. R. Gilder, G. W. Garrison, A. J. Spear, P. M. Kotani, B. D. Trumpis, B. K. Levitt, C. E. Hanna, and B. Dorsch Jan. 1975

NPO-13245

Handbook presents design and analysis of tracking, telemetry, and command functions utilized in these systems with particular emphasis on deep-space telecommunications. Antenna requirements are also discussed. Handbook provides number of tables outlining various performance criteria. Block diagrams and performance charts are also presented.

R74-10285

LOGARITHMIC-FUNCTION GENERATOR

P. R. Caron Feb. 1975 ERC-10267

Solid-state logarithmic-function generator is compact and provides improved accuracy. Generator includes a stable multivibrator feeding into RC circuit. Resulting exponentially decaying voltage is compared with input signal. Generator output is proportional to time required for exponential voltage to decay from preset reference level to level of input signal.

HIGH-EFFICIENCY MULTIFREQUENCY FEED

J. S. Ajioka (Hughes Aircraft Co.), G. I. Tsuda (Hughes Aircraft Co.), and W. A. Leeper (Hughes Aircraft Co.) Feb. 1975

GSFC-11909

Mutual blockage and mutual coupling are eliminated with multifrequency feed. Feed provides common aperture for 6-GHz and 4-GHz bands and crossed dipole for 1-GHz band. Design is highly efficient and has good polarization diversity.

B74-10296

HIGH-SPEED FAULT-TOLERANT TELEMETRY/COMPUTER INTERFACE

G. C. Gilley

Feb. 1975

NPO-13139

Fault-tolerant telemetry/computer interface allows memory sharing by two data processing systems and maintains integrity of fault-tolerant environment of computer.

B74-10299

APPARATUS FOR HEAT TREATING PLASTIC BELTS

A. Topits, Jr. Feb. 1975

NPO-13205

Apparatus performs programed rotating, stretching/shrinking and heat treatment necessary to fabrication of high-performance plastic belts. Belts can be treated in lengths varying from 7 to 48 in., in widths up to 1 in., and in thicknesses up to approximately 0.003 in.

LOCATION OF VEHICLES USING AM STATION BROAD-CASTING SIGNALS

G. R. Hansen, Jr.

Feb. 1975 NPO-13217

Imaginary hyperbolic grid patterns formed by three local AM broadcasting stations were utilized in study. Each hyperbola is defined by constant phase difference between arbitrary signals integrally related to those coming from two stations. When three stations are used, grid is formed covering area with intersecting hyperbolas.

03 PHYSICAL SCIENCES

ZEROS OF CERTAIN CROSS PRODUCTS OF BESSEL **FUNCTIONS OF FRACTIONAL ORDER**

W. A. Rostafinski

Apr. 1974 See also NASA-TM-X-2698

LEWIS-12221

Interpolation between values given in table of zeros is permitted provided curve is traced between at least three values from table. Zeros have been obtained on digital computer and results were rounded off to the fourth decimal point.

B74-10019

DIRECTORY OF AEROSPACE SAFETY SPECIALIZED INFORMATION SOURCES

E. A. Fullerton (Systems Develop. Corp.), L. S. Rubens (Systems Develop. Corp.), G. Mandel, and P. J. McKenna Jun. 1974 See also NASA-CR-121206

LEWIS-12223

Directory aids safety specialists in locating information sources and individual experts in engineering-related fields. Lists 170 organizations and approximately 300 individuals who can provide safety-related technical information in form of documentation, data, and consulting expertise. Information on hazard and failure cause identification, accident analysis, and materials characteristics are covered.

B74-10022

RADIOISOTOPE THERMAL GENERATOR (RTG) POWER CONDITIONER

W. S. Stacey (Martin Marietta Corp.)

Apr. 1974

LANGLEY-11313

New regulator: (a) permits operation with high-impedance radioisotope thermal generators at conversion efficiencies typically above 90%; (b) does not require input filtering; (c) eliminates current spiking; and (d) is simple, efficient, and reliable. Converter-charger pair could be adapted for other power levels by changing transistor, diode, capacitor bank, and inductor.

B74-10038

DUALLY-MODE-LOCKED ND: YAG LASER

J. Osmundson, E. Rowe, and D. Santarpia

Jul. 1974

GSFC-11746

Mode-locking is stabilized effectively by conventional loss-modulator and phase-modulator, mode-locking elements placed in laser cavity in optical series with one another. Resulting dually-mode-locked system provides pulses with constant phase relative to mode-lock drive signal without presence of relaxation oscillation noise.

B74-10042

RECORDER/PROCESSOR APPARATUS

I. H. Shim (Image Inform. Inc.) and J. J. Stelben (Image Inform. Inc.)

Jul. 1974

GSFC-11553

Laser beam is intensity modulated in response to incoming video signals. Latent image is recorded on rotating drum which generates raster in conjunction with incrementally-driven lens carriage. Image is fed automatically to thermal processor; actual image is developed by controlled application of heat onto medium containing latent image.

B74-10051

RADIOISOTOPE HEATER

T. H. Smith, III (TRW Systems Group, TRW, Inc.), D. B. Evans (TRW Systems Group, TRW, Inc.), and A. J. Steinberger (TRW Systems Group, TRW, Inc.)

May 1974 ARC-10791

One-watt heater unit is about size of flashlight cell and can be safely handled for several minutes without danger. Unit is completely sealed and can withstand buildup of helium pressure from isotope disintegration for up to 30 years. Number of units can be safely grouped together.

B74-10054

EXTENDIBLE PROBE FOR ATMOSPHERE SAMPLING

W. J. Jones (McDonnell-Douglas Corp.), G. D. Mitchell (McDonnell-Douglas Corp.), and G. M. Jones (McDonnell-Douglas Corp.) May 1974

ARC-10829

Sampling probe is extended through small plug in heat shield by loaded bellows to sample planetary atmosphere for compositional analysis and total pressure during entry of space probe. Assembly prevents contamination of sample by gases from pyrotechnic device and serves as sealed plenum for atmospheric pressure sensor.

B74-10055

TOROIDAL EQUIPMENT PACKAGING

W. J. Jones (McDonnell-Douglas Corp.) and J. W. Sherwood (McDonnell-Douglas Corp.)

May 1974 ARC-10828

For optimal packaging of equipment in shallow-cone vehicle toroidal packaging sets center of gravity of equipment forward. Packages are supported on rings within probe structure to provide low center of gravity. System permits interchanging of units for

balance control, so minimum of lateral ballast is required.

B74-10056

BATTERY ACTIVATION SYSTEM

C. Sollo (McDonnell-Douglas Corp.), D. L. Smith (McDonnell-Douglas Corp.), and V. P. King (McDonnell-Douglas Corp.) May 1974

ARC-10832

Initiator is fired to set off gas generator; gas flows into manifold and as gas pressure increases, chlorotrifluoroethylene diaphragms transfer force to polyethylene bags filled with electrolyte. Small membrane at base of each bag is ruptured, allowing electrolyte to flow into cells.

B74-10060

MEASUREMENT OF TEMPERATURE PROFILES IN HOT GASES AND FLAMES

R. S. Simmons (Univ. of Mich.), H. Y. Yamada (Univ. of Mich.), G. H. Lindquist (Univ. of Mich.), and C. B. Arnold (Univ. of Mich.)

Jul. 1974 See also NASA-CR-120894; NASA-CR-72491 LEWIS-12055

Computer program was written for calculation of molecular radiative transfer from hot gases. Shape of temperature profile was approximated in terms of simple geometric forms so profile could be characterized in terms of few parameters. Parameters were adjusted in calculations using appropriate radiative-transfer expression until best fit was obtained with observed spectra.

B74-10063

LONG LIFE NEUTRON GENERATOR TARGET USING DEUTERIUM PASS-THROUGH STRUCTURE

D. L. Alger Jul. 1974

LEWIS-11866

Target structure permits all deuterons, except the one-in-a-million that interacts with tritium atom to produce a neutron, to pass completely through target structure and be returned to vacuum system. Since tritium atoms are not displaced as in conventional targets, tritium population will remain unchanged while under deuteron bombardment.

B74-10065

METHOD OF MEASURING THE THICKNESS OF RADIOACTIVE THIN FILMS

D. L. Alger, R. Steinberg, and M. D. Makinen Jul. 1974 See also NASA-TM-X-68170

LEWIS-11971

Thickness monitor consists of proportional X-ray counter coupled to pulse counting system, copper filter over face of counter, rotatable collimator containing radioactive source, and rotatable shutter. Monitor can be used as integral part of neutron generator. It has been used to measure titanium tritide film thicknesses from 0.1 to 30 micrometers.

B74-10066

A HIGH YIELD NEUTRON TARGET

D. L. Alger, R. Steinberg, and P. Weisenbach Aug. 1974 See also B74-10065; NASA-TM-X-68179

LEWIS-12058

Target, in cylinder form, rotates rapidly in front of beam. Titanium tritide film is much thicker than range of accelerated deutron. Sputtering electrode permits full use of thick film. Stream of high-velocity coolant provides efficient transfer of heat from target.

B74-10071 MODULATED HYDROGEN-ION FLAME DETECTOR: A CONCEPT

J. Dimeff Jun. 1974

ARC-10322

To improve sensitivity of flame ionization detectors chop flow of sample into flame so resulting ionization will be modulated and therefore readily amplified independently of steady-state background ionization, thermoelectric effects, contact potentials, etc. Detector should discriminate sharply between desired signal and undesired signals.

B74-10072

PROBE FOR MEASURING TURBULENT REAL-TIME SHEAR-STRESS WAVES

D. Y. Cheng Jun. 1974 ARC-10755

To measure spectrum, magnitude, and time-average value of turbulent shear stress in flow of gas use small, hollow sphere suspended in flow to measure drag fluctuations in two 90 deg-directions as function of time.

B74-10081

COBALT BASE SUPERALLOY HAS OUTSTANDING PROPERTIES UP TO 1478 K (2200 F)

R. A. Harlow (Philco-Ford Corp.), F. H. Harf, and J. C. Freche Aug. 1974 See also NASA-CR-121189; NASA-CR-72726 LEWIS-12089

Alloy VM-103 is especially promising for use in applications requiring shart time exposure to very high temperatures. Its properties over broad range of temperatures are superior to those of comparable commercial wrought cobalt-base superalloys, L-605 and HS-188.

B74-10094

VIEWGRAPH PREPARATION MADE EASIER

H. W. Broskie, E. E. Burcher, F. K. Gough, Jr., S. J. Katzberg, and H. B. Pate, Jr.

Aug. 1974

LANGLEY-11612

Rolls of color-reversal film permit exposure of over 200 viewgraphs on one film loading. Time is saved in film development as roll film lends itself readily to automatic processing.

B74-10101 SHORT-RANGE LASER OBSTACLE DETECTOR

W. L. Kuriger Aug. 1974

NPO-11856

Detector, designed for slow-moving vehicle to explore surface of Mars, will automatically divert vehicle from obstacles as small as 0.5 m in its path. Detector comprises injection laser operating in pulse time-delay measurement, or radar, mode. It is capable of scanning area extending from few meters to approximately 30 m

B74-10102

LASER-SCANNING TECHNIQUES FOR RAPID BALLISTICS IDENTIFICATION

R. C Woodburgy and R. B. Nakich (Time Zero Corp.) Aug. 1974

NPO-11861

Two different laser-scanning methods may be utilized. In

each case scanned cylindrical bullet surface is displayed "unwrapped" on oscilloscope screen. Bullets are compared by photographing each display and superimposing negatives of two images. With some modifications bullets can be scanned and compared by superimposing images on screen of dual-beam oscilloscope.

IMPROVED DISPENSING TARGETS FOR ION BEAM PARTICLE GENERATORS

C. G. Miller

Aug. 1974

NPO-13112

Beam impinges on palladium-silver tube, which is target, and heats impinged surface causing local hot spot. Contained gas diffuses through hot spot to meet incoming beam and produce desired particles. When beam is turned off, target spot cools and stops dispensing contained gas.

B74-10116

ANALYSIS OF ORBITAL HEAT TRANSFER

T. Buna (Martin Marietta Corp.)

Aug. 1974 -- ARC-10844

Graphical representation of orbital heat balance in form of polar diagrams is obtained from integral expressions of orbital heat transfer whereby quantities of heat are represented as areas swept by "thermal radii,"

B74-10117

VALVE DEGRADATION DETECTOR

N. H. Doshi (TRW Systems Group, TRW, Inc.)

Aug. 1974

ARC-10850

To determine corrosive degradation of valve while it is in service, detect changes in surface roughness or presence of corrosive layers at junction of poppet and seat by measuring temperature gradients created across junction by small heat source.

B74-10118

SURFACE ROUGHNESS MEASURED BY OPTICAL SIGNA-**TURES**

R. J. Salvinski (TRW Systems Group, TRW, Inc.) and T. V. Roszhart (TRW Systems Group, TRW, Inc.) Aug. 1974

ARC-10853

To measure roughness of metal surfaces by nondestructive means direct laser beam at surface and record distribution pattern of intensity of reflected light to obtain optical signature for comparison with calibrated surface. Signature of machined surface with scratch compared to that of regularly-patterned machined surface may also detect imperfections.

WAVELENGTH-SELECTIVE, SEQUENTIAL Q-SWITCHING LASER CAVITY

F. Allario and R. A. Lucht

Sep. 1974

LANGLEY-11045

Single-frequency continuous output of laser is converted into series of high-power laser pulses at high repetition rates. Applications include pollutant detection by absorption, laser gain measurements at discrete wavelengths, laser propagation measurement, and laser plasma diagnostics.

B74-10136

GRAPHITE IONIZATION VACUUM GAUGE

G. A. Beitel (Midwest Res. Inst.) and D. K. Benson (Midwest Res. Inst.)

Sep. 1974 See also NASA-CR-2101

LANGLEY-11338

Triode gauge with electron source, electron collector, and positive ion collector made from either graphite or carbon material extends low-pressure ranges of existing gauges by changing only materials used in construction. Advantages of graphite gauge stem from physical properties of graphite (or carbon).

B74-10139

OPTICAL DISCRIMINATOR SYSTEM

D. B. Robelen Sep. 1974

LANGLEY-11580

System includes lightweight, inexpensive movie camera to record simultaneously views from three different angles on same filmstrip. This is noncritical system as it is adaptable to many applications requiring similar, but diverse, viewing areas.

B74-10143

RADIO-CONTROLLED, SOUND-OPERATED SWITCH

T. D. Bryant and D. W. Soloman, Jr.

Sep. 1974

LANGLEY-11641

Switch presently provides remote control switching, by radio signals, or pollution sampling devices. Can be used for remote weather station interrogation, firing of pyrotechnics, control of dangerous equipment, or control of device in location where it is impractical to run metallic conductors because of time limitations, distance, or terrain.

B74-10149

REMOTE SUNFALL MONITOR: A CONCEPT

R. B. Lollar (IBM) and R. R. Mandt (IBM)

Sep. 1974

M-FS-22943

Monitor is proposed as spectral monitor system designed to record digital data simultaneously from two types of sensors, mounted on both stationary assembly and tracking assembly. Both direct and total values of solar radiation are recorded. System may measure solar energy collector efficiencies for three main conversion technologies.

B74-10152

AUTOMATIC MARKER FOR PHOTOGRAPHIC FILM

N. M. Gabbard and W. M. Surrency .

Sep. 1974

MSC-14705

Commercially-produced wire-marking machine is modified to title or mark film rolls automatically. Machine is used with film drive mechanism which is powered with variable-speed, 28-volt dc motor. Up to 40 frames per minute can be marked, reducing time and cost of process.

B74-10161

ELECTROSTATICALLY CONTROLLED HEAT SHUTTER

L. J. Derr

Sep. 1974

NPO-11942

Electrically controlled chamber filled with inert gas efficiently removes heat from heat-generating components. System can be reversed to bring heat from external source to component.

B74-10166

LASER-ACTUATED MECHANICAL DEVICE

A. J. Murphy and L. C. Yang

Sep. 1974

NPO-13105

Actuator is portable and can be used in high-temperature (over 500 C) environments by incorporating tungsten metal film and quartz window. Actuator can be triggered when it is not directly in laser beam path by utilizing fiber optics. It is advantageous for remotely switching ultra-high voltage systems.

B74-10167

IMPROVED CONTROL FOR NUCLEAR/THERMIONIC POWER SOURCE: A CONCEPT

C. D. Sawyer Sep. 1974

NPO-13114

Variable-gain power regulator is used to maintain constant load voltage. There are two feedback loops. One is tied directly with regulator to feed error voltage, which is sum of reference and load voltages. Second loop is tied with reactor, where output current of thermionic fuel elements is fed back to signal generator.

B74-10168

METHOD FOR REMOTELY SENSING TURBULENCE OF PLANETARY ATMOSPHERES

R. T. Woo and A. Ishimaru

Sep. 1974

NPO-13154

Based on variances of log-amplitude and phase fluctuations of radio occultation data received from orbital and fly-by missions, structure constant for Venusian planetary atmosphere has been estimated with high-confidence factor. Analysis indicates that effects of inhomogeneity, finite size, and superrefractivity of atmospheric turbulence cannot be ignored.

B74-10173

THROTTLEABLE HEAT PIPE

B. D. Marcus (TRW Systems Group, TRW, Inc.)

Sep. 1974

ARC-10848

Variable thermal conductance is provided by throttling or interrupting vapor flow between evaporator and condenser sections of heat pipe. Potential advantage of throttling technique is that no bulky gas reservoirs are required. Entire condenser is maintained at nearly uniform temperature so there is better thermal interface with surrounding equipment.

B74-10181

SPECTROMETER

D. H. Menzel (Geophysics Corp. of Am.)

Nov. 1974

GSFC-11694

Ultraviolet spectrometer measures pure monochromatic wavelengths in predetermined narrow wave bands. Two stages are incorporated: stationary dispersed beam is intercepted by array of slits cut into plate at discrete wavelength locations; second stage is inverted spectrometer which recombines dispersed spectrum at single exit slit.

B74-10182

DYNAMIC POLARIZATION COMPENSATING SYSTEM FOR OPTICAL COMMUNICATIONS RECEIVER

M. W. Fitzmaurice and J. B. Abshire

Nov. 1974

GSFC-11782

Electro-optic cell is located in optical path of input light beam. Cell includes crystal for controlling phase between two polarization states. Cell axes are rotated 45 deg to receiver axes defined by vertical and horizontal polarization states. Voltage across cell compensates for bias by introducing different phase retardation along crystal axes.

B74-10184

CALORIMETRIC DETECTION OF NEUTRAL-ATOM CON-TENT OF ION BEAM

A. S. Roberts, Jr. (Old Dominion Univ.)

Nov. 1974

LANGLEY-11505

Energy deposition technique deduces neutral-beam flux or dose from measured values of incremental resistance increases in platinum wire passed through beam. Steady-state heat balance analysis led to equivalent neutral-beam current. Method was used to detect neutral-atom content of 60-keV argon ion beam.

B74-10187

FLIGHT TESTS OF VORTEX-ATTENUATING SPLINES

J. C. Patterson, Jr.

Nov. 1974

LANGLEY-11645

Visual data on formation and motion of lift-induced wingtip vortex were obtained by stationary, airflow visualization method. Visual data indicated that vortex cannot be eliminated by merely reshaping wingtip. Configuration change will likely have only small effect on far-field flow.

B74-10194

LASER SYSTEM TO DETONATE EXPLOSIVE DEVICES

V. J. Menichelli and L. C. Yang

Nov. 1974 NPO-11743

Detonating system is not affected by electromagnetic interference. System includes laser source, Q-switch, and optical fiber connected to explosive device. Fiber can be branched out and connected to several devices for simultaneous detonation.

B74-10195

IMPROVED XENON LAMP FOR SOLAR SIMULATORS: A CONCEPT

L. F. Schmidt Nov. 1974 NPO-13128

Short-arc xenon lamp proposes to produce more uniform solar output. With this lamp, both axes of sensors can be tested with same setup. Lamp includes cathode with conical tip and annular anode. Annulus is supported by angled projection to avoid interference with passage of light generated by arc.

B74-10200 DIGITAL MULTICHANNEL PHOTOMETER

E. A. Beaver (Univ. of Ca.) and C. E. McIlwain (Univ. of Ca.) Nov. 1974

HQ-10791

System was developed for use in astronomy and other research, areas concerned with detection of faint-light images. Photometer system is comparable in performance to good photomultiplier tube array except that digital electronics are used instead of analog.

B74-10202

IGNITION OF SOUNDING ROCKET MOTORS WITH HAND-PUMPED AIR

E. L. Rakowsky (Singer Co.) and V. P. Marchese (Singer Co.) Nov. 1974 See also NASA-CR-2418

LANGLEY-11152

Method demonstrates inexpensive, safe, and foolproof concept for solid propellant rocket motors, using simple handpump to deliver air. Flueric ignition was accomplished using system without stored energy and with complete absence of electrical energy and wiring.

B74-10211

FLUID DYNAMICS TEST METHOD

W. H. Gayman Nov. 1974

Nov. 1974 NPO-11895

Test method and apparatus determine fluid effective mass and damping in frequency range where effective mass may be considered as total mass less sum of slosh masses. Apparatus is designed so test tank and its mounting yoke are supported from structural test wall by series of flexures.

B74-10212

ULTRASONIC SCANNER FOR FOOTPRINT IDENTIFICA-TION

L. J. Derr Nov. 1974 NPO-13055

Scanner includes transducer, acoustical drive, acoustical receiver, X and Y position indicators, and cathode-ray tube. Transducer sends ultrasonic pulses into shoe sole or shoeprint. Reflected signals are picked up by acoustic receiver and fed to cathode-ray tube. Resulting display intensity is directly proportional to reflected signal magnitude.

B74-10216

HEAT PIPE WITH HOT GAS RESERVOIR

B. D. Marcus (TRW Systems Group, TRW, Inc.) Nov. 1974 See also NASA-CR-114530

ARC-10847

Heat pipe can reverse itself with gas reservoir acting as evaporator, leading to rapid recovery from liquid in reservoir. Single layer of fine-mesh screen is included inside reservoir to assure uniform liquid distribution over hottest parts of internal surface until liquid is completely removed.

B74-10217

SYSTEM FOR MEASURING TRANSIENTS IN FLUID FLOW

D. J. Pearson (TRW Systems Group, TRW Inc.) Nov. 1974

ARC-10852

When test valve is actuated, piston is moved by pressurized fluid, and displacement is monitored by electro-optical tracking system and recorded by oscilloscope camera. Electro-optical monitor produces output voltage proportional to displacement of piston.

B74-10223

FIELD-SEQUENTIAL STEREO TELEVISION

W. E. Perry Nov. 1974 MSC-12616

System includes viewing devices that provide low interference to normal vision. It provides stereo display observable from broader area. Left and right video cameras are focused on object. Output signals from cameras are time provided by each camera. Multiplexed signal, fed to standard television monitor, displays left and right images of object.

B74-10224

INSPECTION OF TRANSPARENT SURFACES USING PHOTOSENSITIVE PAPER

F. R. Minton and U. O. Graham

Nov. 1974

MSC-19442

Window surface is laid flat on top of photosensitive paper. Opposite side of glass is covered by black cloth. Window edges are then illuminated by light flash through fiber optics. Exposed paper is processed and inspected. Paper shows scratches, bubbles, dust particles, and fingerprints on glass surface.

B74-10229

COAXIAL ANODE IMPROVES SENSITIVITY OF GAS RADIATION COUNTERS

W. L. Kraushaar (Univ. of Wisc.) Dec. 1974 See also B73-10282

GSFC-11492

Anode wire itself is enclosed by three segments. Two on ends are rejector segments, and middle one is primary charge-detecting segment. Anode wire is made from tungsten and is surrounded by enamel insulation. Enamel is covered by segments of vapor-deposited gold. At one point in center segment, gold layer makes direct contact with anode wire.

B74-10230

PARTICLE IMPACT LOCATION DETECTOR

S. O. Auer

Dec. 1974 See also B73-10282

GSFC-11829

Detector includes delay lines connected to each detector surface strip. When several particles strike different strips simultaneously, pulses generated by each strip are time delayed by certain intervals. Delay time for each strip is known. By observing time delay in pulse, it is possible to locate strip that is struck by particle.

B74-10232

COMPACT SOURCE OF SOFT X-RAYS

P. Gorenstein (Am. Sci. and Eng., Inc.) and B. Harris (Am. Sci. and Eng., Inc.)

Dec. 1974 HQ-10732

Sources of soft X-rays uses alpha particles to fluoresce light elements such as boron, carbon, and magnesium. X-ray wavelengths are varied by changing target. Technique supplies broad range of monoenergetic X-rays whose energy can be adjusted very easily.

B74-10243

IMPROVED NONDISPERSIVE INFRARED ANALYZER

J. Dimeff

Dec. 1974 See also B72-10198

ARC-10802

Light from radiant energy source passes through filter, sample, and reference gas chambers to detector. Chamber with amount of gas to be measured is sealed. Filter may be gelatinous, interference, dispersive, or negative-gas, as required.

COMBINED EFFECTS OF A CONVERGING BEAM OF LIGHT AND MIRROR MISALIGNMENT IN MICHELSON INTERFER-**OMETRY**

L. W. Kunz and D. Goorvitch

Dec. 1974

ARC-10889

Expressions have been derived and calculations have been made which show that combined effects lead to asymmetric interferograms and reduction in power at zero path difference. Criteria are given for estimating maximum allowable mirror misalignment.

B74-10254

IMPROVED MAGNETIC SUSPENSION TECHNIQUE

P. A. Studer Jan. 1975

Technique combines electromagnetic coil with polarized permanent magnets. This reduces power consumption of electromagnetic units and improves response of magnetic suspension systems, by increasing their sensitivity to changes in current controlling electromagnet.

R74-10261

NOISE SUPPRESSOR

W. E. Zorumski Jan. 1975 See also NASA-TR-R-419

LANGLEY-11141

Suppressor reduces noise propagated through ducts. It provides high attenuation in given duct length. Entire device forms acoustic trap which utilizes reflective elements on ends to direct sound energy into sound-dissipating element in center. Device achieves large suppression by utilizing interactive effects of different suppression devices.

B74-10271

VOLUME MEASURING SYSTEM

J. S. Oele (Lockheed Missiles and Space Co.)

Jan 1975

MSC-13972

Chamber is designed to be airtight; it includes face mask for person to breathe outside air so that he does not disturb chamber environment. Chamber includes piston to vary air volume inside. Also included are two microphone transducers which record pressure information inside chamber.

B74-10275

IMPROVED CHANNEL MULTIPLIER FOR RADIATION-AND-PARTICLE DETECTORS

K. C. Schmidt (Bendix Corp.)

Jan. 1975

NPO-12128

Multiplier is formed of glass and includes cylindrically-shaped main channel element having length-to-diameter ratio of 50 to 1. Element has open slot along its length. Attached to slot edges are two glass plates set at an angle to each other. Inside surfaces are coated with secondary electron emissive coating.

B74-10291

FLAT DEVICE FOR HEAT CONCENTRATION OR DISPER-SION

R. V. Jenkins and A. P. Sabol

Feb. 1975

LANGLEY-11699

Device provides low-cost unit for efficiently transferring heat between, either to or from, flat surface and central point or region. It is based upon vapor heat transfer principle and therefore, extends applicability of heat pipe.

B74-10293

ACOUSTIC-OPTIC DEFLECTOR TELESCOPE

W. C. Stewart (RCA) Feb. 1975

M-FS-23107

In construction of page-organized holographic memories, it is necessary to provide collimated laser beam which can be deflected parallel to itself. This is used for selecting stored holograms from two-dimensional array. Three-lens system significantly reduces optical path length.

B74-10301

THERMOELASTIC ANALYSIS OF SOLAR CELL ARRAYS AND THEIR MATERIAL PROPERTIES

M. A. Salama, W. J. Rowe, and R. K. Yasui Feb. 1975 See also NASA-CR-135713 NPO-13458

Announced report discusses experimental test program in which five different solar cell array designs were evaluated by subjecting them to 60 thermal cycles from minus 190 deg to 0.0 deg. Results indicate that solder-coated cells combined with Kovar n-interconnectors and p-interconnectors are more durable under thermal loading than other configurations.

04 MATERIALS/CHEMISTRY

B74-10002

A NEW NICKEL-BASE WROUGHT SUPERALLOY FOR APPLICATIONS UP TO 1033 K (1400 F)

W. B. Kent (Universal-Cyclops Corp.), H. L. Black (Universal-Cyclops Corp.), F. H. Harf, and S. G. Young

Mar. 1974 See also B74-10003; NASA-CR-120934 LEWIS-11827

Alloy was melted from high purity raw materials and cast ingots extruded at 1422 K. Material was hot rolled to 0.013 m diameter bar stock. Partial solution heat-treatment followed by aging produced structure of fine gamma prime precipitate reinforcing gamma matrix containing coarser blocky gamma prime particles. Alloy can be processed by powder metallurgy.

NEW NICKEL-BASE WROUGHT SUPERALLOY WITH APPLICATIONS UP TO 1253 K (1800 F)

W. B. Kent (Universal-Cyclops Corp.), H. L. Black (Universal-Cyclops Corp.), R. V. Miner, Jr., F. H. Harf, and S. G. Young Mar. 1974 See also B74-10002; NASA-CR-120934 LEWIS-11828

Alloy possesses combination of high tensile strength at low and intermediate temperatures to 1033 K with good rupture strength at high temperatures to 1255 K. Alloy has promise for turbine disk application in future gas turbine engines and for wrought integrally bladed turbine wheel; thickness and weight of disk portion of wheel could be reduced.

B74-10005

CRITERIA FOR SELECTING RESIN MATRICES FOR IMPROVED COMPOSITE STRENGTH

C. C. Chamis, M. P. Hanson, and T. T. Serafini Mar. 1974 See also NASA-TM-X-68166 LEWIS-12057

Area under matrix of typical stress-strain diagram bounded by one percent strain is good index for priority assessment of matrix contribution to composite strength. Initial tangent modulus to stress-strain curve is useful parameter in translating matrix properties to composite properties.

B74-10007

ADDITION OF SILICON IMPROVES OXIDATION RESIST-ANCE OF NICKEL BASED SUPERALLOYS

C. E. Lowell and R. V. Miner, Jr.

Mar. 1974 See also NASA-TM-X-68191; NASA-TN-D-6838 LEWIS-12138

Specific weight changes of nickel-base superalloy B-1900 and B-1900 + 1% Si specimens were tested at 1273 K. B-1900 was losing weight at an increasing rate due to spalling of oxide scale while B-1900 + 1% Si was still gaining weight at low, nearly constant rate. Similar comparison in weight change was observed for specimens tested at 1373 K.

CASTING COPPER TO TUNGSTEN FOR HIGH-POWER ARC LAMP CATHODES

H. A. Will

Apr. 1974 See also NASA-TM-X-2865

LEWIS-12169

Voids forming at interface when copper is cast onto tungsten can be eliminated by adding wetting agent during casting process. Small amount of copper and nickel are cast onto thoriated tungsten insert, insert is recast with more copper to form electrode. Good thermal conductance results in long-lived cathode.

PLASMA-SPRAYED METAL-GLASS FLUORIDE COATINGS FOR LUBRICATION TO 1170 K (1650 F)

H. E. Sliney

Jun. 1974 See also NASA-TN-D-7556

LEWIS-11930

Plasma spray of Nichrome matrix composite contains dispersed glass for oxidation protection and calcium fluoride for lubrication. Coatings can be applied to bearing journals and bearing bores. Coating was easily machinable and had excellent bond strength on substrate metal.

B74-10017

IMPROVED EPITAXIAL PROCESS FOR FABRICATING SILICON CARBIDE SEMICONDUCTOR DEVICES

H. A. Will and J. A. Powell

Jun. 1974 See also NASA-TN-D-7558

LEWIS-12094

Process of growing expitaxial silicon carbide (SiC) layers on SiC substrates so that epitaxial growth is perpendicular to c-axis by chemical vapor deposition process at temperatures of 1590 to 1660 K minimizes variations in stacking sequence and problems associated with high temperatures.

B74-10027

GLASS FIBER ADDITION STRENGTHENS LOW-DENSITY ABLATIVE COMPOSITIONS

H. H. Chandler (Martin Marietta Corp.)

Apr. 1974

LANGLEY-11288

Approximately 15% of E-glass fibers was added to compositions under test and greatly improved char stability. Use of these fibers also reduced thermal strains which, in turn, minimized char shrinkage and associated cracks, subsurface voids, and disbonds. Increased strength allows honeycomb core reinforcement to be replaced by equivalent amount of glass fibers.

B74-10032

METHODS FOR IMPROVED RESOLUTION OF FLOW **ELECTROPHORESIS CELLS**

L. R. McCreight (GE) and G. L. Fogal (GE)

May 1974 M-FS-22223

First method involves remote adjusting of zeta potential. Second approach sandwiches two conducting metal plates between opposite cell walls and thin insulating layer. Third method forces buffer to flow in direction opposite particle streams.

B74-10036

COMBUSTION PRODUCTS GENERATING AND METERING DEVICE

R. E. Wiberg and J. A. Klisch

Jul. 1974

GSFC-11095

Device simulates incipient fire conditions in closely-controlled

adjustable manner, to give predetermined degree of intensity at selected locations throughout area, and to verify that detection system will respond. Device can be used with and for cross calibration and experimentation in conjunction with commercially available products of combustion analyzing meters.

ECONOMICAL TECHNIQUE FOR FRAGMENTATION **TESTING**

T. H. Smith, III (TRW Systems Group, TRW, Inc.) and B. A. Snoke (TRW Systems Group, TRW, Inc.) May 1974

ARC-10792

Automatic rifle was modified for remote, single-shot use. To simulate statistically--determined fragment size from rocket-motor casing blunt-nosed bullet was made of same alloy. Cartridge was loaded with enough powder to make bullet reach target at same estimated velocity as shrapnel from rocket casing.

B74-10053

SILVER OXIDE SORBENT FOR CARBON DIOXIDE

G. V. Colombo (McDonnell-Douglas Corp.)

May 1974 See also NASA-CR-114632

ARC-10797

Material can be regenerated at least 20 times by heating at 250 C. Sorbent is compatible with environment of high humidity; up to 20% by weight of carbon dioxide can be absorbed. Material is prepared from silver carbonate, potassium hydroxide or carbonate, and sodium silicate.

B74-10057

ENZYMATIC REGENERATION OF ADENOSINE TRIPHOS-PHATE COFACTOR

D. L. Marshall (Battelle Mem. Inst.-Columbus Labs.) May 1974

ARC-10837

Regenerating adenosine triphosphate (ATP) from adenosine diphosphate (ADP) by enzymatic process which utilizes carbamyl phosphate as phosphoryl donor is technique used to regenerate expensive cofactors. Process allows complex enzymatic reactions to be considered as candidates for large-scale continuous processes.

B74-10073

CUSHION MODULE FOR STOWING ELECTRONIC EQUIP-

J. R. Rogers and R. M. Elam, Jr.

Jun. 1974

ARC-10779

To provide vibration-resistance composition adjust processing techniques, which produces essentially void-free materials and provides for clean removal of finished material from mold. Microsphere filler imparts strength to polymer and sodium carbonate imparts flame-resistance.

R74-10074

VOLUME-REFLECTING DIELECTRIC HEAT SHIELD

P. R. Nachtsheim, D. L. Peterson, and J. T. Howe Jun. 1974

ARC-10803

White, volume-reflecting dielectric material absorbs essentially none of the incident radiant energy, and continues to reflect even though in severe environment its surface is melted and is being vaporized. Process of overall reflectance in dielectric material. involving internal refractions and reflections, is similar to process of reflection in paints.

R74-10077

NEW POLYMER SYSTEMS: CHAIN EXTENSION BY DIANHYDRIDES

R. A. Rhein and J. D. Ingham

Jul. 1974

NPO-13046

Three anhydrides provide effective chain extension of hydroxy-terminated polyalkylene oxides and polybutadienes. Novel feature of these anhydride reactants is that they are difunctional

as anhydrides, but they are tetrafunctional if conditions are selected that lead to total esterification or reaction of all carboxyl groups.

B74-10082

HIGH STRENGTH NICKEL BASE ALLOY, WAZ-16, FOR **APPLICATIONS UP TO 2200 F**

W. J. Waters and J. C. Freche

Aug. 1974 See also NASA-TN-D-7648

LEWIS-12270

Alloy product is high strength, high temperature nickel base material with higher incipient melting temperature than all known nickel base alloys. It is microstructurally stable and has high impact resistance both before and after prolonged thermal exposure. It contains relatively few alloying constitutents and low content of expensive and rare metals.

RAPID METHOD FOR DETERMINING NITROGEN IN TANTALUM AND NIOBIUM ALLOYS

E. J. Merkle, J. W. Graab, and W. F. Davis Sep. 1974 See also NASA-TM-X-3067 LEWIS-12237

Adaptation of commercial instrument which measures nitrogen and oxygen in steel gave results in less than four minutes. Sample is heated in helium atmosphere in single-use graphite crucible. Platinum flux facilitates melting of sample. Released gases are separated chromatographically and measured in thermalconductivity cell.

B74-10095

DETECTION OF CRACKS IN SURFACE INSULATION

L. J. Leger

Aug. 1974

MSC-14187

Volatile organic liquid surface penetrants used with appropriate detector paper leave tested surfaces uncontaminated. Method can be used to detect minute cracks in materials such as metal, glass, plastics, ceramics, etc.

B74-10096

IN-PROCESS OXIDATION PROTECTION IN FLUXLESS BRAZING OR DIFFUSION BONDING OF ALUMINUM **ALLOYS**

K. P. O'Kelly (LTV Aerospace Corp.) and A. B. Featherston (LTV Aerospace Corp.)

Aug. 1974 See also NASA-CR-128805

MSC-14435

Aluminum is cleaned of its oxide coating and is sealed immediately with polymeric material which makes it suitable for fluxless brazing or diffusion bonding. Time involved between cleaning and brazing is no longer critical factor.

B74-10111

ACCURATE THICKNESS MEASUREMENT OF EASILY COMPRESSED MATERIALS

L. W. Carlson (Rocketdyne/N. Am. Rockwell Corp.)

Aug. 1974

ARC-10551

Sheet of material is placed between two thin, uniform, and flat sheets of glass of known thickness; light pressure is applied by means of weights. Micrometer aids thickness measurement of sandwich. Thickness of two sheets of glass is then subtracted.

COMMERCIALLY AVAILABLE BLACK CHROME IS AN **EFFECTIVE SOLAR COLLECTOR COATING**

G. E. McDonald

Sep. 1974 See also NASA-TM-X-71596

LEWIS-12159

Black chrome, electroplated decorative finish, which absorbs and retains solar energy is readily available, easily applied, and low cost. It is indistinguishable from black nickel and is equally feasible on aluminum or steel.

B74-10122

GUIDEBOOK OF NONDESTRUCTIVE EVALUATION

TECHNIQUES FOR MATERIALS AND STRUCTURES

Nov. 1974 See also NASA-SP-3079

LEWIS-12272

Seventy nondestructive techniques for evaluating material and structures are described in guidebook. Standardized format facilitates comparison of their merits and limitations for solving various problems. Guide includes index of flaw types and tabulated guide to use of nondestructive evaluation techniques. Alternative technique names are cross-referenced.

FABRICATION OF COMPLEX STRUCTURES OR AS-SEMBLIES BY HOT ISOSTATIC PRESSURE (HIP) WELDING

A. N. Ashurst (Battelle Mem. Inst.), M. Goldstein (Battelle Mem. Inst.), M. J. Ryan (Battelle Mem. Inst.), G. G. Lessmann (Westinghouse Astronucl. Lab.), and W. A. Bryant (Westinghouse Astronucl. Lab.)

Nov. 1974 See also NASA-CR-120923; NASA-CR-72795 LEWIS-11490

HIP welding is effective method for fabricating complex structures or assemblies such as alternator rotors, regenerativelycooled rocket-motor thrust chambers, and jet engine turbine blades. It can be applied to fabrication of many assemblies which require that component parts be welded together along complex interfaces.

B74-10132

SOFT, THERMALLY CONDUCTIVE MATERIAL

A. J. Anderson (Martin Marietta Corp.)

Sep. 1974

LANGLEY-10850

Silicon rubber filled with high percentage of silver-plated copper microspheres provides soft, thermally conductive seat for thermal switch. Material also could be used in thin sheet form to prevent corrosion between dissimilar metals while maintaining good thermal communication. It could be used as thermal gasketing.

R74-10133

TWO-PHASE, PASSIVE SEPARATOR-AND-FILTER ASSEM-BLY

A. C. Erickson (GE) and F. J. Porter, Jr. (GE)

Sep. 1974 LANGLEY-10976

Assembly separates liquid from gas by passive hydrophilic/ hydrophobic material approach. Apparatus is comprised of porous glass hydrophilic tubes. Quantity, lateral size, and pore size of glass tubes are determined by particular design requirements with regard to water rate, water quality contamination level, application endurance life, and operating differential pressure level.

B74-10154

POLYMER COMPOSITIONS SUITABLE FOR USE IN **ENRICHED OXYGEN ATMOSPHERES**

E. C. Schule (Allied Chem. Corp.), P. P. Salatiello (Allied Chem. Corp.), and S. Chandrasekaran (Allied Chem. Corp.)

Sep. 1974 See also NASA-CR-134062

MSC-14618

Three organic polymer systems are based on copolymer of chlorotrifluoroethylene, ethylene, and tin-based flame retardants. Fourth system is copolymer of chlorotrifluorethylene and tetrafluoroethylene. This system contains no stabilizers of flame retardant additives.

B74-10157

FLAME RESISTANT ELASTIC ELASTOMERIC FIBER

J. T. Howarth (Little/Arthur D./Inc.), S. Sheth (Little/Arthur D./Inc.), A. A. Massucco (Little/Arthur D./Inc.), and K. R. Sidman (Little/Arthur D./Inc.)

Sep. 1974 See also NASA-CR-128505

MSC-14331

Compositions exhibit elastomeric properties and possess various degrees of flame resistance. First material polyurethane, incorporates halogen containing polyol and is flame resistant in air; second contains spandex elastomer with flame retardant

additives; and third material is prepared from fluorelastomer composition of copolymer of vinylidene fluoride and hexafluoro-

B74-10159

POLYELECTROLYTES WITH HIGH CHARGE DENSITY

A. Rembaum and S.-P. S. Yen

Sep. 1974 NPO-11918

Polymers can be used as flocculants to clarify residential and industrial water supplies and as bactericidal and fungicidal agents. They can be used in preparation of electroconductive photocopy papers, to improve living cell adhesion to glass or plastic, and as anticancer agents.

B74-10175

SEMIPERMANENT SEALING OF LEAKS IN HIGH VACUUM SYSTEMS

J, D. Christian and W. P. Gilbreath

Sep. 1974

ARC-10881

Silicone-rubber adhesive is applied externally to seal hairline cracks in sections of high vacuum system while system is partially evacuated. No pretreatment of surface is required since adhesive will be drawn into crack while diffusion or ion pump is off.

B74-10177

DOMESTIC WASH WATER RECLAMATION

J. B. Hall, Jr., C. E. Batten, and J. R. Wilkins

Oct. 1974 See also NASA-TN-D-7600

LANGLEY-11606

System consists of filtration unit, reverse-osmosis module, tanks, pumps, plumbing, and various gauges, meters, and valves. After water is used in washing machine or shower, it is collected in holding tank. Water is pumped through series of five particulate filters. Pressure tank supplies processed water to commode water closet.

B74-10201

APPARATUS FOR MONITORING LINEAR EXPLOSIVE PERFORMANCE

L. J. Bement

Nov. 1974

LANGLEY-10800

Techniques provide performance monitoring standard for acceptance, lot qualification, and comparison testing of devices. Exhibit high degree of simplicity, accuracy, and reproducibility. Apparatus simultaneously measures explosive pressure stimulus energy, explosive cutting, or rupturing, ability, and detonation propagation rate.

R74-10208

VISUALIZATION OF SMOKE STACK PLUME

R. J. Exton

Nov. 1974

LANGLEY-11675

System consists of ultraviolet vidicon tube, interference and color filters, ultraviolet telephoto lens, monitor, and waveform analyzer to extract information from video scene, stack plume viewed against sky. System will view SO2 and any other element which absorbs light at wavelength used.

B74-10218

METALLIZED POLYMERIC FOAM MATERIAL

B. A. Birnbaum (Hughes Aircraft Co.) and N. Bilow (Hughes Aircraft Co.)

Nov. 1974

ARC-10860

Open-celled polyurethane foams can be coated uniformly with thin film of metal by vapor deposition of aluminum or by sensitization of foam followed by electroless deposition of nickel or copper. Foam can be further processed to increase thickness of metal overcoat to impart rigidity or to provide inert surface with only modest increase in weight.

B74-10219

MOISTURE-RESISTANT BAFFLE MATERIAL FOR FUEL TANKS

N. Bilow (Hughes Aircraft Co.)

Nov. 1974

ARC-10861

Test results indicated superiority of certain polyether-based polyurethanes as protective coatings and suggested that baffle-materials with one of these coatings should have useful life approximately twice that of uncoated foams now in use.

EVALUATION OF TEST PROCEDURES FOR HYDROGEN ENVIRONMENT EMBRITTLEMENT

H. G. Nelson Nov. 1974

ARC-10919

Report presents discussion of three common and primary influences on embrittlement process. Application of theoretical considerations to design of test coupons and methods is illustrated for both internal and external hydrogen embrittlement. Acceptable designs and methods are indicated.

B74-10244

HIGH-TEMPERATURE TENSILE TESTER FOR CERAMICS

M. Smith Dec. 1974

ARC-10822 Apparatus measures tensile strength of rigid, low-density ceramic materials at temperatures up to 1375 K. Tensile grips mate with tensile specimen and form top and bottom of lightweight

furnace. Apparatus can only be used with rigid materials and grips must be stronger than material under test.

B74-10247

ADVANCED FIBER-COMPOSITE HYBRIDS--A NEW STRUCTURAL MATERIAL

C. C. Chamis, R. F. Lark, and T. L. Sullivan Dec. 1974 See also NASA-TM-X-71580

LEWIS-12118

Introduction of metal foil as part of matrix and fiber composite, or "sandwich", improves strength and stiffness for multidirectional loading, improves resistance to cyclic loading, and improves impact and erosion resistance of resultant fiber-composite hybrid structure.

R74-10248

ADVANCED TUNGSTEN FIBER-REINFORCED NICKEL SUPERALLOY

D. W. Petrasek and R. A. Signorelli

Dec. 1974 See also 866-10551; B73-10003; NASA-CR-120925; NASA-TN-D-6881; NASA-TN-D-7773

LEWIS-12394

Matrix composition, fabrication technique, and fiber diameter were selected to minimize fiber-matrix reaction and preserve composite strength. Composites may be used in place of superalloys where higher strength or greater strength-to-density ratios are advantageous, and will permit higher operating temperatures in particular applications.

B74-10264

CONTROLLED INTERMITTENT INTERFACIAL BOND CONCEPT FOR COMPOSITE MATERIALS

T. U. Marston (Univ. of Mich.) and A. G. Atkins (Univ. of Mich.) Jan. 1975

LANGLEY-11628

Concept will enhance fracture resistance of high-strength filamentary composite without degrading its tensile strength or elastic modulus. Concept provides more economical composite systems, tailored for specific applications, and composite materials with mechanical properties, such as tensile strength, fracture strain, and fracture toughness, that can be optimized.

HIGH-STRENGTH ALLOY WITH RESISTANCE TO HYDRO-**GEN-ENVIRONMENT EMBRITTLEMENT**

T. G. McNamara (Rockwell Intern. Corp.) Jan 1975

M-FS-19234

Alloy is precipitation-hardened, high-strength, and lowthermal-expansion materials. It is iron-based and contains nickel and chromium at lower levels than high-strength alloys. It is readily welded and brazed and has good oxidation resistance. Tests indicated there was no reduction of notched or smooth strenath.

B74-10268 CARBON MONOXIDE DETECTOR

J. L. Bradspies (Tyco Labs., Inc.), S. B. Brummer (Tyco Labs., Inc.), G. L. Holleck (Tyco Labs., Inc.), and L. L. Nelsen (Tyco Labs., Inc.) Jan. 1975

M-FS-23090

Electrochemical sensor continuously monitors levels of carbon monoxide in air. Device is based on electrochemical oxidation of carbon monoxide in detector cell. Detector can operate on 115-Vac external power source, 28-Vdc external power source, or for 200 hours on internal 12-V NiCd batteries.

05 LIFE SCIENCES

B74-10029

AUTOMATED MONITORING OF RECOVERED WATER QUALITY

J. E. Misselhorn (Aerojet Med. And Biol. Systems), W. H. Hartung (Aerojet Med. and Biol. Systems), and S. W. Witz (Aerojet Med. and Biol. Systems)

May 1974

LANGLEY-11203

Laboratory prototype water quality monitoring system provides automatic system for online monitoring of chemical, physical, and bacteriological properties of recovered water and for signaling malfunction in water recovery system. Monitor incorporates whenever possible commercially available sensors suitably modified.

B74-10075

PROGRAMMED PRESSURE AIR SUPPLY FOR POSITIVE-PRESSURE BREATHING SYSTEM

S. J. Troutman, Jr. (Webb Associates) and J. F. Annis (Webb . . Associates)

Jun. 1974 ARC-10845

Motor-driven cam varies height of mercury column connected to loading diaphragm of pressure-regulating valve. Air supplied to open-loop, positive pressure breathing system is controlled so repetitive pressure--time profiles can be obtained during every insufflation--exhaust cycle.

B74-10080

IMPROVED HIGH VOLUME AIR SAMPLER

R. B. King Aug. 1974

LEWIS-11644

Sampler permits size separations of particles by directing sampled air through cross-sectional area sufficiently large that air velocity is reduced to point where particles or larger size will settle out. Sampler conducts air downward and through slots around periphery of unit into relatively open interior of house.

B74-10103

COMPACT TELEMETRY PACKAGE FOR REMOTE MONI-TORING OF NEUTRON RESPONSES IN ANIMALS

C. D. Baker Aug. 1974

NPO-11887

Battery-powered telemeter includes FM transmitter and is light enough to be mounted on animal's head. Animal has complete freedom of movement while its neuron responses are transmitted to receiver in laboratory. Construction may also be applied to monitor blood pressure, body temperature, and different muscular signats.

B74-10119

THERMISTOR HOLDER FOR SKIN-TEMPERATURE MEAS-UREMENTS

J. E. Greenleaf and B. A. Williams

Aug. 1974

ARC 10855

Sensing head of thermistor probe is supported in center area of plastic ring which has tabs so that it can be anchored in place by rubber bands or adhesive tapes. Device attaches probes to human subjects practically, reliably, and without affecting characteristics of skin segment being measured.

B74-10140

THERAPEUTIC HAND-EXERCISING DEVICE WITH CY-CLING PRESSURE VALUE

D F Barthlome Sep. 1974

LANGLEY-11579; LANGLEY-11595

Device exercises hands of persons whose fingers are generally straight and need to be flexed inward toward palms of hands. Device is extremely simple in design, which reduces costs, and fits all hand sizes. Patient can instantly free hand from device by pulling flap free from wrist of straps.

B74-10153

IODINE GENERATOR FOR DISINFECTING RECLAIMED WATER

R. A. Wynveen (Life Systems, Inc.), J. D. Powell (Life Systems, Inc.), and F. H. Schubert (Life Systems, Inc.)

Sep. 1974 See also NASA-CR-134219

MSC-14632

System dispenses iodine into water tank automatically in quantities varying from 0.5 to 20 ppm. It stores 180-day supply of iodine crystals, sufficient to support six people consuming water at rate of 4.5 to 13.6 kg per person per day.

B74-10155

INEXPENSIVE LIGHTWEIGHT MIRROR

G. D. Badhwar and L. G. Fehrenkamp Sep. 1974

MSC-14615

Aluminized Mylar film is bonded to polyurethane foam mold; Mylar is then removed, leaving highly reflective coating of aluminum on foam. Mold may be used repeatedly to make mirrors for several optical instruments. Large mirrors of almost any shape may be made singularly or in quantity.

B74-10172

FINGER RECORDING ELECTRODE SYSTEM FOR ELECTRI-CAL IMPEDANCE PLETHYSMOGRAPH

L. D. Montgomery and D. L. Moody, Jr.

Sep. 1974

ARC-10816

System facilitates location of recording electrodes of impedance plethysmograph that is used for measuring flow of blood in finger segment; electrodes can be relocated accurately and volume of finger segment under study can be determined precisely. System minimizes movement artifacts in plethysmograph trace because finger segment is held firmly.

ARTIFICIAL LIMB CONNECTION

L. J. Owens Nov. 1974

KSC-10833

Connection simplifies and eases donning and removing artificial limb; eliminates harnesses and clamps; and reduces skin pressures by allowing bone to carry all tensile and part of compressive loads between prosthesis and stump. Because connection is modular, it is easily modified to suit individual needs

AUTOMATED SINGLE-SLIDE STAINING SYSTEM

S. M. Mills and J. R. Wilkins

Nov. 1974

LANGLEY-11649

Apparatus developed to Gram-stain single slides automatically is flexible enough to accommodate other types of staining procedures. Method frees operator and eliminates necessity for subjective evaluations as to length of staining or decolorizing

B74-10199

NEW TOOTH ENAMEL FROM BRUSHITE CRYSTALS

B. Rubin and J. D. Childress

Nov. 1974 ERC-10338

Appropriate nutrient gel solution could be used to precipitate brushite, which becomes hydroxyapatite, mineral found in bones and teeth. Gel can be made from sodium metasilicate and phosphoric acid, or gelatin, or other organic materials that polymerize in presence of acid to get gelantinous medium.

POLYMERS USED TO ABSORB FATS AND OILS: A CONCEPT

H. E. Marsh, Jr.

Nov. 1974

NPO-11609

One approach to problem of excessive oils and fats is to develop method by which oil is absorbed into solid mixture for elimination as solid waste. Materials proposed for these purposes are cross-linked (network) polymers that have high affinity for aliphatic substances, i. e., petroleum, animal, and vegetable oils.

B74-10213

AUTOMATED DRUG IDENTIFICATION SYSTEM

C. F. Campen, Jr.

Nov. 1974

NPO-13063

System speeds up analysis of blood and urine and is capable of identifying 100 commonly abused drugs. System includes computer that controls entire analytical process by ordering various steps in specific sequences. Computer processes data output and has readout of identified drugs.

B74-10220

SPACECRAFT OXYGEN RECOVERY SYSTEM

P. D. Quattrone

Nov. 1974 See also B71-10203; B72-10051; B72-10074; B72-10194; B72-10195; B72-10219; B72-10246

ARC-10868

Recovery system is comprised of three integrated subsystems: electrochemical carbon dioxide concentrator which removes carbon dioxide from atmosphere, Sabatier reactor in which carbon dioxide is reduced with hydrogen to form methane and water, and static-feed water electrolysis cell to recover oxygen from water.

B74-10226

EMERGENCY DESCENT DEVICE

R. R. Belew

Nov. 1974 See also B73-10369

M-FS-23074

Device includes cable wound on reel; special assembly enclosed in fluid medium controls unwinding speed of cable during descent. Device is compact and reliable. It can be rewound quickly because reel disengages from latches when it is turned in opposite direction.

B74-10231

IMPROVED METHODS FOR COUNTING BACTERIA IN PHYSIOLOGICAL FLUIDS

G. L. Picciolo

Dec. 1974 See also B71-10051

GSFC-11917

Bacterial population detection is based on detection of adenosine triphosphate (ATP), chemical present in all living matter. Amount of ATP in sample, after chemically removing all nonbacterial ATP, is directly related to bacterial population. Sensitivity is improved by concentration step; specificity is improved by lowering pH of solution.

B74-10245

IN VIVO MEASUREMENT OF MECHANICAL IMPEDANCE OF BONE

D. R. Young and G. Thompson (M. B. Associates)

Dec. 1974

ARC-10857

System of measurement provides indications of ulnar properties independent of characteristics of surrounding soft tissue and other bones. Mechanical modal approximated ulnar response so average bending rigidity could be determined to provide direct index of bone resistance to bending loading.

B74-10249

LIQUID-COOLED LINER FOR HELMETS

B. A. Williams and W. Elkins (Aerotherm Corp.)

Dec. 1974

ARC-10534

Liner acts as coolant tubing, manifold, and supporting structures. Fabric of waffle-design is made of several integrated channels (or capillaries) through which coolant liquid can flow. Thin and light-weight liner can be incorporated into any type of helmet or head gear.

B74-10278

LIQUID SAMPLE PROCESSOR

V. J. Jahnsen and C. F. Campen, Jr.

Jan. 1975 See also B74-10213

NPO-13136

Processor is automatic and includes series of extraction tubes packed with fibrous absorbent material of large surface area. When introduced into these tubes, liquid test samples become completely absorbed by packing material as thin film.

MICRO-ORGANISM DISTRIBUTION SAMPLING FOR **BIOASSAYS**

B. A. Nelson (Martin Marietta Corp.)

Feb. 1975

LANGLEY-10789

Purpose of sampling distribution is to characterize sample-tosample variation so statistical tests may be applied, to estimate error due to sampling (confidence limits) and to evaluate observed differences between samples. Distribution could be used for bioassays taken in hospitals, breweries, food-processing plants, and pharmaceutical plants.

06 MECHANICS

MECHANICAL COUPLING FOR HIGH CYCLIC LOADING

M. O. Dustin and O. Mehmed

Mar. 1974 See also NASA-TM-X-2812

LEWIS-11690

One-piece cylindrical coupling with "necked-down" regions at each end form flexures allowing small misalignments between actuator and load. Coupling has zero backlash, low mass, close spacing between actuator and load, high stiffness in direction of motion, and allowance for misalignments and deflections without causing high side loading on components.

B74-10013

LIGHTWEIGHT, HIGH SPEED BEARING BALLS: A CONCEPT

R. J. Parker

Apr. 1974 See also B70-10331

LEWIS-11087

Low mass bearing balls with hardened iron-plated surfaces can eliminate problems of low fatigue strength and flexure fatigue. and lead to increased life and reliability of high speed ball bearings. Low mass balls exert lower centrifugal forces on outer race of bearing thus eliminating detrimental effect of high speed operation.

B74-10028

WIRELESS TELEMETRY SYSTEM FOR FLOATING BODIES

L. T. Fain and H. E. Cribb Jul. 1974

KSC-10855

Unit includes rugged waterproof cables and equipment containers, low power, sturdy antenna construction, and easy equipment setup and serviceability. Accuracy and reliability of entire measurement system were not sacrificed.

B74-10030

IMPROVED GENEVA MECHANISM

C. H. Debenham (TRW, Inc.)

May 1974

LANGLEY-11443

Locking disk (flange) is stepped and lug is added to each arm of star wheel. These changes allow much longer cutout in star wheel stations, essentially eliminating chatter and wear. Jamming problem can be solved by extending star wheel arms and flaring slots.

B74-10045

BRAKE FOR ROLLABLE PLATFORM

A. L. Morris

May 1974

ARC-10512

Frame-mounted brake is independent of wheels and consists of simple lever-actuated foot. Brake makes good contact with surface even though foot pad is at higher or lower level than wheels, this is particularly important when a rollable platform is used on irregular surface.

B74-10046

REVERSED COWL-FLAP THRUST AUGMENTOR

D. Y. Cheng

May 1974 ARC-10754

Inlet mouthpiece with variable geometry improves low-speed performance of inlet (or ejector) of jet engines by use of reversed cowl-flap mechanism. Flaps can be adjusted mechanically or system can be operated with pressure taps set so pressure on inlet face is always smaller than pressure on back of inlet.

B74-10048

SOLAR ARRAY DEPLOYMENT FROM A SPINNING **SPACECRAFT**

A. H. Carlin (TRW Systems Group, TRW, Inc.), J. B. Gardner (TRW Systems Group, TRW, Inc.), and H. A. Lassen (TRW Systems Group, TRW, Inc.)

May 1974

ARC-10787

Cylindrical drum, wrapped with flexible solar array of solarcells mounted on Mylar sheet, is held by two end-fittings with cable (under tension) passing through axel of drum. Drum is held to end-fittings by axial cable through drum axel; drum is released for deployment when cable is cut at each end and end-fittings spring outward.

B74-10049

THRUST VECTOR CONTROL FOR V/STOL AIRCRAFT

E. W. Toney (McDonnell-Douglas Corp.)

May 1974

ARC-10788

To deflect exhaust of V/STOL aircraft fan deploy set of rectangular flaps so exhaust stream can be turned as required. and then directed through exit nozzles which generate thrust in appropriate direction; lateral deflection of exhaust is provided by yaw vanes.

B74-10058

VENTED VECTORING-NOZZLE FOR STOL AND V/STOL AIRCRAFT

D. W. Esker (McDonnell-Douglas Corp.)

May 1974

ARC-10839

Vented vectoring-nozzle has superior thrust coefficient and is lighter in weight because it does not require completely enclosed elbow duct ordinarily used to deflect nozzle flow. Improved nozzle has primary nozzle and three-sided elbow deflector.

B74-10059

PROPELLANT ACQUISITION DEVICE FOR USE WITH A SPINNING TOROIDAL TANK

J. E. Anderson (Martin Marietta Corp.)

May 1974 ARC-10840

System consists of four radially disposed communication channels attached to propellant-retaining ring situated at bottom of toroidal tank. Ring-and-channel acquisition system design

provides uniform propellant distribution within spinning tank during all mission phases.

B74-10061 DESIGN CRITERIA MONOGRAPH FOR ACTUATORS AND **OPERATORS**

Innovator not given Jul. 1974 See also NASA-SP-8090

Instrumentation for actuators and operators includes electrical position-indicating switches, potentiometers, and transducers and pressure-indicating switches and transducers. Monograph is based on critical evaluation of experiences and practices in design, test, and use of these control devices and instruments in operational space vehicles.

B74-10070

SUPPRESSION OF BENDING MOTION IN ELASTIC BODIES

J. C. Howard Jun. 1974

XAC-05632

Sensor may be located on aircraft at such point that there can be extracted output signal which is function of aircraft acceleration. Signals are supplied to summing device where they are combined to produce output signal which controls application of suppression forces.

B74-10076

DYNAMIC TRANSFORMATION METHOD

J. R. Admire, E. J. Kuhar, Jr. (GE), and C. V. Stahle, Jr. (GE) Jul. 1974

M-FS-22848

Eigenvalue problem associated with modal-synthesis vibration analysis of complex structures requires simplifying assumptions for solution. Computer program, Dynamic-transformation Adapted to Modal-synthesis Using Stiffness-coupling, improves computational economy for vibration analysis of complex structures while still considering substructure modes.

B74-10087

DESIGN CRITERIA MONOGRAPH FOR VALVE COMPO-NENTS

Innovator not given Sep. 1974 See also NASA-SP-8094 LEWIS-12327

Monograph treats valve design technology problems as they were solved in successful development of flightweight operational valves for liquid rocket systems. General practices for cleaning and contamination prevention are summarized. Balance of information is arranged by topic, since detail design requirements apply to most types of valves.

B74-10091

PREDICTION OF UNSTEADY AERODYNAMIC LOADINGS CAUSED BY TRAILING-EDGE CONTROL-SURFACE MOTIONS IN SUBSONIC COMPRESSIBLE FLOW

M. C. Redman (Boeing Co.), W. S. Rowe (Boeing Co.), and B. A. Winther (Boeing Co.)

Aug. 1974

LANGLEY-11175

Program determines direct surface loadings, using pressure terms that correctly represent known singularity functions around boundaries or wing with control surface. Program provides numerical prediction of unsteady loadings caused by controlsurface motions.

B74-10092

HEAT-TRANSFER THERMAL SWITCH

M. V. Friedell (Martin Marietta Corp.) and A. J. Anderson (Martin Marietta Corp.)

Aug. 1974 LANGLEY-11232

Thermal switch maintains temperature of planetary lander, within definite range, by transferring heat. Switch produces relatively large stroke and force, uses minimum electrical power, is lightweight, is vapor pressure actuated, and withstands sterilization temperatures without damage.

B74-10131

MAGNETIC BEARINGS WITH COMBINED RADIAL AND **AXIAL CONTROL**

L. Veillette Sep. 1974 GSFC-11551

Bearings reduce friction by allowing air of vacuum gaps between rotating members through properly-applied magnetic fields. Advantages: There is no physical contact between rotor and support structure; bearings operate directly in vacuum environment without lubrication; and there is unlimited operating lifetime, independent of speed.

B74-10135

THERMALLY-STABLE, SYNTACTIC PYRRONE FOAMS

B. G. Kimmel (Hughes Aircraft Co.)

Sep. 1974 See also NASA-CR-2222

LANGLEY-11325

Foam formulations may be readily emplaced in honeycomb structures after heating to soft, doughlike consistency and forcing heated mixture into honeycomb cells. Final cure can be accomplished by simple oven cure, with no need for containment or restriction of foam formulation during cure.

CONTROL VANE FOR ENGINE EXHAUST FLOW

C. S. Shaw (USAAMRDL-Langley Directorate) and J. C. Wilson (USAAMRDL-Langley Directorate)

Sep. 1974 See also NASA-TM-X-3016

LANGLEY-11570

Vane solves problem of hot-gas exhaust impingement on curved-duct exteriors, shielding, and other nearby structure components. To eliminate secondary egress of exhaust, curved vane is placed upstream of engine exhaust duct and in close proximity to exhaust exit to induce free-stream flow more in line with exit.

B74-10144

SELF-LEVELING LOAD TABLE

J. L. Burch Sep. 1974

M-FS-22039

Table floats in tank of water and has air compartments underneath. Table height and level are controlled by automatic adjustment or air pressure within these compartments.

B74-10146

ANTISKID BRAKING SYSTEM

J. S. Pazdera (Univ. of Mo.)

Sep. 1974

M-FS-22807

Published report describes analytical development and simulation of braking system. System prevents wheels from skidding when brakes are applied, significantly reducing stopping distance. Report also presents computer simulation study on system as applied to aircraft.

B74-10151

SEPARATION DYNAMICS OF S-II DERIVATIVE LAUNCH

L. A. Schmidt (Rockwell Intern. Corp.) and W. D. Vinson, Jr. (Rockwell Intern. Corp.) Sep. 1974

M-FS-24325

Computer program analyzes separation dynamics between two vehicles from time prior to separation to later time when separation may be considered complete. Program also may be used in evaluating various separation schemes and synthesizing separation systems by manipulation of data and various program ontions.

B74-10156

HOLOGRAPHIC EVALUATION OF FATIGUE CRACKS BY A COMPRESSIVE STRESS (HYSTERESIS) TECHNIQUE

S. A. Freska (Martin Marietta Corp.) and W. D. Rummel (Martin Marietta Corp.)

Sep. 1974 See also NASA-CR-2369

MSC 14555

Holographic interferometry compares unknown field of optical waves with known one. Differences are displayed as interference bands or fringes. Technique was evaluated on fatigue-cracked 2219-T87 aluminum-alloy panels. Small cracks were detected when specimen was incrementally unloaded.

B74-10174

SWASHPLATE FEEDBACK CONTROL FOR TILT-ROTOR **AIRCRAFT**

H. R. Alexander (Boeing Vertol Co.), J. P. Magee (Boeing Vertol Co.), and J. J. Morris (Boeing Vertol Co.)

Sep. 1974 See also NASA-CR-114600; NASA-CR-114664

ARC-10854

Changes in angle of attack in system were sensed indirectly by gages which responded to strains induced in wing structure. Output signals were amplified, filtered, and used to activate swashplate actuators. System provided significant reduction in blade loads and desirable changes in hub forces and moments.

B74-10179

PULSE-WIDTH-MODULATED SERVO VALVE FOR AUTO-PILOT SYSTEM

H. D. Garner

Oct. 1974

LANGLEY-11643

Valve was developed for autopilot wing-lever system and is to be used in light, single-engine aircraft. Valve is controlled by electronic circuit which feeds pulse-width-modulated correction signals to two solenoids. Valve housing is cast from plastic, making it very economical to fabricate.

B74-10193

AUTOMATIC SOLDERING MACHINE

J. A. Stein (Rockwell Intern. Corp.)

Nov. 1974

MSC-19401

Fully-automatic tube-joint soldering machine can be used to make leakproof joints in aluminum tubes of 3/16 to 2 in. in diameter. Machine consists of temperature-control unit, heater transformer and heater head, vibrator, and associated circuitry controls, and indicators.

B74-10227

DESIGN CRITERIA MONOGRAPH FOR VALVE AS-SEMBLIES

Innovator not given Dec. 1974 See also NASA-SP-8097 LEWIS-12332

Monograph is limited to valve selection factors for trade-off

06 MECHANICS

studies, configuration analyses, actuator selection, and integration of components. Material is organized along lines of valve design sequence.

B74-10228

DESIGN CRITERIA MONOGRAPH ON CENTRIFUGAL FLOW TURBOPUMPS

Innovator not given Dec. 1974 See also NASA-SP-8109 **LEWIS-12346**

Monograph reviews and assesses current design practices, and from them establishes firm guidance for achieving greater consistency in design, increased reliability in end product, and greater efficiency in design effort. Review should be of interest to manufacturers and users of pumps, power drives, turbine drives, and rotary equipment in general.

B74-10233

LAMINATING CORED, STRESSED-FACE, SANDWICH STRUCTURES

W. C. Heier Dec. 1974 XLA-11028

Structure assemblies of fragile and flexible components are rigidly supported from aggregate exterior during bonding operation. Support assures conformance to desired profiles and duplication of assembly results. It minimizes exterior surface identification with core character, improving structure rigidity while adding desirable aerodynamic qualities and finished appearance.

B74-10235

ENVIRONMENTAL CONTROL AND WASTE MANAGEMENT SYSTEM DESIGN CONCEPT

A. R. Gandy Dec. 1974

LANGLEY-11588

Passive device contains both solid and liquid animal waste matter for extended period without being cleaned and without contaminating animal. Constant airflow dries solid waste and evaporates liquid matter. Technique will maintain controlled atmospheric conditions and cage cleanliness during periods of 6 months to 1 year.

B74-10238

NONDESTRUCTIVE TESTING OF RAILROAD WHEELS AND RAILS BY ULTRASONICS

W. N. Clotfelter and E. R. Risch

Dec. 1974

M-FS-23086

Quality control of wheels and rails can be improved by using ultrasonic technique developed for measuring stresses in metallic materials. In addition, parts already in use can be tested and replaced if they are found to be unsafe. Test equipment includes two transducers.

B74-10241

IMPLEMENTATION OF A SELF-CONTROLLING HEATER: A CONCEPT

M. G. Strange

Dec. 1974 See also NASA-TN-D-7248

GSFC-11752

Proposed heater uses its own temperature coefficient for sensing function. Heating power is supplied from current source, heater voltage containing temperature information. Dynamic stability is very high since there is no thermal lag as would exist with separate heater and sensor.

B74-10252

EXPANDABLE SPACE FRAMES

A. H. Schoen Jan. 1975 ERC-10365

Frame consists of struts connected by hinge joint assemblies. Because struts are hinged, entire frame can be collapsed during transportation and expanded at construction site. Frame has two types of hinge joint assemblies; one for three-dimensional space frame expansion and another for two-dimensional expansion.

B74-10267

LEAD-OXYGEN CLOSED-LOOP BATTERY SYSTEM

W. J. Britz, W. A. Boshers, and J. J. Kaufmann Jan 1975

M-FS-23059

Calculations show that battery can deliver up to 35 watt-hours per pound, conventional lead-acid batteries deliver 10 to 15 watt-hours per pound. Weight reduction is due to replacement of solid lead-peroxide electrodes with metal current-collector screen, catalyst, and Teflon membrane.

B74-10273

FLANGE DESIGN FOR LARGE-SCALE MODULAR ASSEMBLY JIGS

M. M. Gilman (Rockwell Intern. Corp.)

Jan. _1975

MSC-19372

Technique incorporates weld-free method for securing flanges to projecting ends of unmachined box-beam framework so flanged structure may be reused without modification. One such framework may be readily assembled to another by simply matching flanges together and passing connecting members between preformed holes in structures.

07 MACHINERY, EQUIPMENT AND TOOLS

B74-10008

DESIGN CRITERIA MONOGRAPH FOR LIQUID PROPELLANT GAS GENERATORS

Innovator not given Mar. 1974 See also NASA-SP-8081 LEWIS-12139

Monograph reviews and assesses current design practices, and from them establishes firm guidance for achieving greater consistency in design, increased reliability in end product, and greater efficiency in design effort. Main emphasis of monograph is on bipropellant gas generators using hydrogen peroxide and hydrazine monopropellants.

B74-10009

VERTICAL COPY CAMERA SYSTEM PROVIDES PHO-TOGRAPHS FROM ERTS-1 IMAGERY

R. J. Schertler and R. E. Texler

Apr. 1974

LEWIS-12140

Versatility of commercially-available camera system permits wide range of enlargement (up to 10X) and reduction (down to 1/8) to be achieved with standard lenses. Use of easily interchangeable camera backs permits photographic formats from 35 mm to 10.2 X 12.7 cm (4 x 5 in) and permits easy use of black and white and color films and Polaroid materials.

B74-10010

DESIGN CRITERIA MONOGRAPH FOR PRESSURE REGULATORS, RELIEF VALVES, CHECK VALVES, BURST DISKS, AND EXPLOSIVE VALVES

Innovator not given Apr. 1974 See also NASA-SP-8080 LEWIS-12168

Monograph reviews and assesses current design practices, and from them establishes firm guidance for achieving greater consistency in design, increased reliability in end product, and greater efficiency in design effort. Five devices are treated separately. Guides to aid in configuration selection are outlined.

B74-10014

DESIGN CRITERIA MONOGRAPH ON TURBOPUMP SHAFTS AND COUPLINGS

Innovator not given May 1974 See also NASA-SP-8101 . LEWIS-12204

Monograph reviews and assesses current design practices, and considers all aspects of turbopump system shaft dynamics peculiar to and necessary to shaft and coupling design. Associated components (bearings, housing, etc.) that influence shaft or coupling design are treated to extent necessary to define that influence.

B74-10020

PROCESS TO RESTORE OBLITERATED SERIAL NUMBERS ON METAL SURFACES

S. G. Young, B. Parker (Sacramento State Univ.), and W. J. Chisum (Calif. State Dept. of Justice)

Jun. 1974 See also B71-10099; NASA-TM-X-52929; NASA-TM-X-68257

LEWIS-12085

Metal smeared into grooves of serial numbers by grinding or filing can be cleaned out by process called cavitation. Ultrasonic vibrator generates very high frequency vibrations in water which create millions of microscopic bubbles. Cavitation bubbles impact metal surface at thousands of pounds per square inch pressure. Metal particles filling grooves are broken away.

B74-10023

MODULAR SUPPORT BLOCKS FOR FLUID LINES

J. M. Dimino (Rockwell Intern. Corp.) and R. D. Deskin (Rockwell Intern. Corp.)

Apr. 1974

MSC-19335

Modular line block comprises matched modular elements machined to accept fluid lines of different diameters. Modules can support different fluid-line configurations. Top and bottom surfaces are machined to accept dovetail strip used for holding modules together. End modules have holes drilled through to accept fastening screws.

B74-10031

PRECISION GLASSCUTTER

D. S. Coombs May 1974

LANGLEY-11604

Glass is positioned against preset stops; and glasscutter, which is permanently mounted in carrier support by cutter guide rails, is used to scribe glass at predetermined length. Glass is placed against predetermined groove at opposite end to correspond with setting of cutter carrier support and it is broken on end of cutter base.

B74-10039

CONTROL OF ELASTICITY IN CAST ELASTOMERIC SHOCK/VIBRATION ISOLATORS

L. Owens and C. Bright

Jul. 1974

KSC-10850

Elasticity is determined by isolators physical dimensions and by type of elastomer used. Once elastomer is selected and cast between two concentric tubes of device, isolator elasticity will remain fixed. Isolators having same dimensions can be built to different elasticity requirements using same elastomer.

B74-10062

IMPROVED CIRCUMFERENTIAL SHAFT SEAL

L. P. Ludwig and T. N. Strom

Jul. 1974 See also NASA-TN-D-7130

LEWIS-11873

Comparative tests of modified and unmodified carbon ring seals showed that addition of helical grooves to conventional segmented carbon ring seals reduced leakage significantly. Modified seal was insensitive to shaft runout and to flooding by lubricant.

B74-10105

SHUTOFF AND THROTTLING VALVE

L. G. Hays Aug. 1974

NPO-11951

Leaktight shutoff, precise flow control, and very low pressure

drop are incorporated in all-metal valve designed for operation under extreme temperatures. Valve constructed with refractory metal is intended for control of high-temperature liquid cesium, but has applications related to control of high- and low-temperature liquids and gases.

B74-10148

DYNAMOMETER FOR MEASURING MACHINING FORCES IN TWO PERPENDICULAR DIRECTIONS

I. A. Sutherland Sep. 1974

M-FS-22899

Published report discusses development of two-component force dynamometer which is used for dynamic measurement of machining forces in cutting and thrust directions. Resulting data suggest that faster metal-cutting machines may be developed that have reduced vibrations.

R74-10164

BOLT INSTALLATION TOOL FOR TIGHTENING LARGE NUTS AND BOLTS

A. R. McDougal and R. M. Norman

Sep. 1974

NPO-13059

Large bolts and nuts are accurately tightened to structures without damaging torque stresses. There are two models of bolt installation tool. One is rigidly mounted and one is hand held. Each model includes torque-multiplier unit.

B74-10237

MECHANICAL ROD PEENING

E. J. Minter and V. P. Caruso

Dec. 1974

M-FS-23047

Tool is inexpensive and gives repeatable results. It is modified commercially-available rod-type weld slag removal gun and is pneumatically operated by regulated compressed air supply.

B74-10240

A BAND CLAMP WITH A SPRING TOUGLE LEVER

M. Simmonds (ATO, Inc.)

Dec. 1974

MSC-14736

Clamp could have several applications, as it provides tolerance for both expansion and contraction. It might be useful with firemen's breathing apparatus and luggage racks and other freight-carrying equipment. Also, using same piece as handle and spring reduces production costs by reducing number of parts.

B74-10266

SELF-REGENERATING DESICCANT SYSTEM

K. G. Anthony and E. P. Herndon

Jan. 1975

M-FS-23057

Compact system uses inherent diurnal cyclic airflow in system and energy of sun as drying heat. System requires no power for operation, has no moving parts to wear out, requires no blowers or manifolds, and is relatively inexpensive to produce.

B74-10269

NEW INSULATION ATTACHMENT METHOD ELIMINATES COMPATIBILITY BONDLINE STRESSES

W. C. Schneider

Jan. 1975

MSC-12615

A uger-shaped single-point fastener attaches rigid surface insulation tiles to orbiter shuttle spacecraft. Method can be used to bond wide variety of materials, including insulation, elastomers, and fibrous materials. Since insulation is attached at only one point, insulation and structure are free to form without inducing bond separation.

B74-10292

MECHANICAL SOLAR MOTOR: A CONCEPT.

L. A. Hein and W. N. Myers

Feb. 1975

M-FS-23062

Motor is proposed to convert radiation from sun directly into mechanical energy. Motor utilizes thermal expansion of liquid, heated by sun, as driving force. Unlike most thermally powered systems, it does not require that liquid be converted into vapor.

B74-10297

STRAIN GAUGE SENSITIVITY IMPROVED BY USING A COMPOSITE BEAM

R. H. Silver and S. H. Kalfayan Feb. 1975 NPO-13170

Composite beam connected to strain gauge and mounted on test specimen is capable of amplifying small strains by factor of 10. Tests indicate that resulting output can be 10 times greater than standard method.

B74-10298

REMOTELY OPERATED GAS-PRESSURE REGULATOR AND SHUTTLE VALVE

E. F. Koch Feb. 1975

NPO-13201

Valve features precise gas-pressure regulation and shuts off flow by remote control. Valve is made up of regulator valve cavity and spring-compression adjusts cavity. Elements in regulator cavity are conventional and include high-pressure inlet, ball which mates with seat, push rod, and pressure-sensing diaphragm.

08 FABRICATION TECHNOLOGY

B74-10018

HIGH STRENGTH, WIRE-REINFORCED ELECTROFORMED STRUCTURES

J. M. Kazaroff, R. A. Duscha, and L. C. McCandless (Gen. Technologies Corp.)

Jun. 1974 See also NASA-CR-134480

LEWIS-12087

Using half-round reinforcing wires, electrodeposited matrix metal readily fills spaces between wires in intimate contact with wires and without voids. Procedure combines advantages of electroforming with high-strength of commonly available wire to produce non-welded shell structures for high pressure uses.

B74-10114

LIGHT-WEIGHT SPHERICAL SUBMERGENCE VESSEL

I. Baker (Hughes Aircraft Co.)

Aug. 1974

ARC-10838

Design vessel with very low thickness-to-radius ratio to obtain low weight, and fabricate it with aid of precision tracer-lathe to limit and control imperfections in spherical shape. Vessel is thin-walled, spherical, monocoque shell constructed from hemispheres joined with sealed and bolted meridional flange.

B74-10125

BINARY ALLOYS FOR REFRACTORY-METAL BRAZING

J. F. Morris

Nov. 1974 See also NASA-TM-X-68190

LEWIS-12184

Data on binary-metal eutectics and melting-point minimums have been assembled for use in selecting brazing filler compositions for refractory metals. Data are presented in four tables for ready reference. Brief discussion of problems and potentials of metallides is included in appendix.

B74-10126

FABRICATION OF THICK STRUCTURES BY SPUTTERING

J. M. Kazaroff, E. D. McClanahan (Battelle Pacific Northwest Labs.), R. Busch (Battelle Pacific Northwest Labs.), and R. W.

Moss (Battelle Pacific Northwest Labs.)
Dec. 1974 See also NASA-CR-134542; NASA-SP-5111
LEWIS-12331

Deposit, 5500-gram of Cu-0.15 wt % Zr alloy, sputtered onto copper cylinder to average thickness of 12.29 mm. Structure was achieved with high-rate sputter deposition for about 100 hours total sputtering time. Material had twice the strength of unsputtered material at temperatures to 723 K and equivalent

B74-10141

PRESSURE APPLICATION TECHNIQUE FOR HIGH-TEMPERATURE COMPOSITE FABRICATION

R. M. Baucom and J. F. Powers

strength at nearly 873 K.

Sep. 1974

LANGLEY-11601

Technique utilizes characteristic of room-temperature vulcanizing rubber (RTV) which expands readily when heated. RTV expansion can exert uniform pressure on filament-reinforced polymer materials during curing. Technology accommodates high-temperature pressure application for P13-N polyimide composite consolidation during cure.

B74-10185

PROCESS FOR FABRICATION OF STABILIZED ALUMINUM PHOSPHATE FIBERS

T. J. Ormiston (GE) and R. A. Tanzilli (GE) Nov. 1974 See also NASA-CR-132331

LANGLEY-11526

Ceramic possesses ideal property combination of high refractoriness and low thermal expansion. Fiber exceeds performance of fused silica fibers at high temperatures. It shrinks less, does not devitrify into unstable cristobalite structure, and is potentially less sensitive to impurities. Might be used for high-temperature insulation, fire protection, composites, and refractories

B74-10214

SIDE WIRE FEED FOR WELDING APPARATUS

J. C. Arnett

Nov. 1974

NPO-13148

Coaxial electrode arrangement has solid central electrode, insulated outer electrode, and transverse channel for feeding wire through tip of electrode assembly. Polymeric insulation is thrust aside by pressure, which is provided by separately operated mechanism acting through central electrode.

B74-10263

LOW-TEMPERTURE ELECTROSTATIC SILICON-TO-SILICON SEALS USING SPUTTERED BOROSILICATE GLASS

C. A. Hardesty, A. D. Brooks (Res. Triangle Inst.), and R. P. Donovan (Res. Triangle Inst.)

Jan. 1975

LANGLEY-11589

Silicon members are hermetically sealed to each other. Process produces no measurable deformation of silicon surfaces and is compatible with package designs of tight tolerance. Seals have been made with glass coatings in 10-mm to 20-mm thickness range without any prior annealing of coated silicon substrates.

B74-10270

PLASTIC COVERING ON AIRFOIL STRUCTURE PROVIDES SMOOTH UNINTERRUPTED SURFACE

J. A. Kinzler, L. G. Fehrenkamp, J. T. Heffernam, and W. S. Lee Jan. 1975

MSC-12631

Primed surface is covered with adhesive. Sheet of plastic film is stretched over adhesive and mechanical holder is used to apply tension to ends of sheet to make it conform to surface of airfoil. After adhesive cures, plastic can be trimmed with sharp cutting tool.

B74-10272

EXPLOSIVE WELDING TECHNIQUE FOR JOINING ALUMI-

NUM AND STEEL TUBES

M. E. Wakefield (Martin Marietta Corp.) Jan. 1975

MSC-14721

Silver sheet is wrapped around aluminum portion of joint. Mylar powder box is wrapped over silver sheet. Explosion welds silver to aluminum. Stainless-steel tube is placed over silveraluminum interface. Mylar powder box, covered with Mylar tape, is wrapped around steel member. Explosion welds steel to silver-aluminum interface.

09 COMPUTER PROGRAMS

, , , B74-10033

DESIGN STANDARDS FOR LOW-PROFILE FLANGES

W. P. Prasthofer

May 1974 M-FS-22708

Analysis of low-profile flange is based on thin shell theory and simple ring theory. Program produces comprehensive design procedure with subsequent stress and deformation analysis. Program was written in FORTRAN IV for UNIVAC 1108 computer.

B74-10034

MODULAR DIGITAL COMPUTER SYSTEM DESIGN Innovator not given (Hughes Aircraft Corp.) Jul. 1974

Automatically-Reconfigurable Modular Multiprocessor System (ARMMS) provides redundant processing with dynamic mode switching in real time. Design will provide higher computer capability than that presently available for same amount of hardware and will furnish modular system which is responsive to diverse problems effectively.

B74-10037

COMPUTER PROGRAM FOR SPACECRAFT-BOOSTER SEPARATION SPRING SELECTION, SET COMPOSITION, AND LOCATION DETERMINATION

Innovator not given (Space Div. of GE) Jul. 1974 GSFC-11616

Program combines all calculation and determination requirements into one comprehensible technique. Program automatically performs selection of separation springs, composition of spring sets, and correct spring location with improved accuracy and reliability.

B74-10040

GRAPHICS SHADOWING ANALYSIS

S. R. Hayes (McDonnell-Douglas Astronautics Co.) Jul. 1974

M-FS-21406

Visual image is generated on cathode-ray tube screen to scale and is constructed according to dimensions of specified craft. Once displayed, image may be manipulated by several different means.

B74.10043

MARSHALL INFORMATION RETRIEVAL AND DISPLAY SYSTEM (MIRADS)

J. L. Groover (Computer Sci. Corp.), S. C. Jones (Computer Sci. Corp.), and W. L. King (Computer Sci. Corp.) Jul 1974

M-FS-22536

Program for data management system allows sophisticated inquiries while utilizing simplified language. Online system is composed of several programs. System is written primarily in COBOL with routines in ASSEMBLER and FORTRAN V.

R74-10044

GENERALIZED CURVE FIT AND PLOTTING (GECAP) PROGRAM

B. D. Beadle, II, B. D. Dolerhie, Jr., J. W. Owen, and R. A. Schlagheck

Jul. 1974

M-FS-22728

Program generates graphs on 8 1/2 by 11 inch paper and is designed to be used by engineers and scientists who are not necessarily professional programers. It provides fast and efficient method for display of plotted data without having to generate any additional FORTRAN instructions.

B74-10067

COMPUTER PROGRAM FOR PREDICTING OFF-DESIGN PERFORMANCE OF CENTRIFUGAL COMPRESSORS

M. R. Galvas (U. S. Army Air Mobility R and D Lab.)

LEWIS-12186

Complete knowledge of compressor overall geometry and working fluid total inlet conditions is required for program's use: On given speed line, compressor performance is calculated for range of inlet velocity levels. Working fluid state conditions and flow properties are calculated using mean stream line onedimensional analysis.

B74-10084

COMPUTER PROGRAM FOR FLEXIBLE ROTOR DYNAMICS ANALYSIS

F. A. Shen (Rockwell Intern. Corp.)

Aug. 1974

LEWIS-12153

Program analyzes general nonaxisymmetric and nonsynchronous transient and steady-state rotor dynamic performance of bending- and shear-wise flexible rotor-bearing system under various operating conditions. Program can be used as analytical study tool for general transient spin-speed and/or nonaxisymmetric rotor motion.

R74-10113

COMPUTATION OF AERODYNAMIC INTERFERENCE BETWEEN LIFTING SURFACES AND LIFT- AND CRUISE-

M. F. E. Dillenius (Nielsen Eng. and Res., Inc.), M. R. Mendenhall (Nielsen Eng. and Res., Inc.), and S. B. Spangler (Nielsen Eng. and Res., Inc.)

Aug. 1974

ARC-10833

Sequence of three computer programs predicts aerodynamic interference on lifting surfaces of transport-type aircraft which are equipped with lift and cruise fans; for example, high-bypassratio engine and wing-pylon tail configuration or fuselage-mounted lift-fan and wing-tail configuration.

B74-10123

COMPUTER PROGRAM FOR CALCULATING WATER AND STEAM PROPERTIES

R. C. Hendricks, I. C. Peller, and A. K. Baron Nov. 1974

LEWIS-12206

Computer subprogram, WASP, accepts any two of pressure, temperature, and density as input conditions. Pressure and either entropy or enthalpy are also allowable input variables. This flexibility is especially useful in cycle analysis. Metastable calculations can also be made using WASP.

B74-10127

DATA SUMMARY AND COMPUTER PROGRAM FOR AXIAL-FLOW PUMP ROTOR PERFORMANCE

M. J. Miller (Iowa State Univ.), T. H. Okiishi (Iowa State Univ.), G. K. Serovy (Iowa State Univ.), D. M. Sandercock, and W. R. Britsch

Dec. 1974

LEWIS-11920

Assembly of noncavitating blade element performance data for axial-flow pump rotor configurations has been collected and organized. Program facilitates handling large amounts of experimental data involved and may be used as data reduction program to process flow and performance measurements from other axial-flow pump configurations.

COMPUTER PROGRAM FOR CALCULATING CRITICAL SPEEDS OF ROTATING SHAFTS

R. J. Trivisonno Dec. 1974 LEWIS-11910

Shaft may include bearings, couplings, extra masses, and disks for gyroscopic effect. Shaft deflection is taken into account and provision is made in program for sections of shaft that are tapered. Plotter produces drawing of shaft with superimposed deflection curves at critical speeds together with all pertinent information related to shaft.

B74-10129

COMPUTER PROGRAM FOR CALCULATING LAMINAR, TRANSITIONAL, AND TURBULENT BOUNDARY LAYERS FOR A COMPRESSIBLE AXISYMMETRIC FLOW

J. A. Albers and J. L. Gregg

Dec. 1974

LEWIS-12178

Finite-difference computer program calculates viscous compressible boundary layer flow over either planar or axisymmetric surfaces. Flow may be initially laminar and progress through transitional zone to fully turbulent flow, or it may remain laminar, depending on imposed boundary conditions, laws of viscosity, and numerical solution of momentum and energy equations.

B74-10130

COMPUTER PROGRAM FOR CALCULATING VELOCITIES AND STREAMLINES ON MID-CHANNEL FLOW SURFACE OF AXIAL OR MIXED-FLOW TURBOMACHINE

T. Katsanis and W. D. McNally

Dec. 1974

LEWIS 12129

Program uses finite-difference and stream filament methods, input consists of blade and flow-channel geometry, upstream and downstream flow conditions from hub to shroud, and mass flow. Output includes streamline coordinates, flow angles, and velocities on mid-channel flow surface.

B74-10145

SPACE ULTRARELIABLE MODULAR COMPUTER (SUMC) INSTRUCTION SIMULATOR

R. T., Curran (Computer Sci. Corp.) and W. A. Hornfeck (Computer Sci. Corp.)

Sep. 1974 M-FS-22697

Simulator has been constructed as set of quasi-independent modules, regulated by one control module. All machine-dependent functions have been resolved such that simulation package is as machine independent as possible.

B74-10169

EIGENFUNCTION SOLUTION OF DAMPED STRUCTURAL SYSTEMS: DAMP

K. K. Gupta Sep. 1974

NPO-13480

Program uses combination of procedures to determine eigenfunction solutions of discrete damped structures, including spinning ones, while fully exploiting banded configuration of associated matrices.

B74-10186

COMPUTER PROGRAM FOR STRUCTURAL ANALYSIS OF LAYERED ORTHOTROPIC RING-STIFFENED SHELLS OF REVOLUTION (SALORS): LINEAR STRESS ANALYSIS

M. S. Anderson, W. L. Heard, Jr., and M. M. Chen (Boston Univ.)

Nov. 1974

LANGLEY-11569

Program handles segmented, laminar, orthotropic shells with

discrete rings. Meridional variations are handled in material properties, temperatures, and wall thickness. Allows for linear variations of temperature through each layer of shell wall.

B74-10189

MODEL OPTIMIZATION USING STATISTICAL ESTIMATION

J. D. Collins (J. H. Wiggins Co.), G. C. Hart (J. H. Wiggins Co.), T. K. Hasselman (J. H. Wiggins Co.), B. Kennedy (J. H. Wiggins Co.), and H. Pack, Jr. (J. H. Wiggins Co.)

Nov. 1974

M-FS-22873

Program revises initial or prior estimate of stiffness and mass parameters to parameters yielding frequency and mode characteristics in agreement with test data. Variances are also calculated and consequently define uncertainties of final estimates.

B74-10190

FORTRAN AUTOMATIC CODE EVALUATION SYSTEM' (FACES)

J. C. Browne (Inform. Res. Associates), T. Davis (Inform. Res. Associates), A. Haller (Inform. Res. Associates), M. Henneman (Inform. Res. Associates), R. Kleir (Inform. Res. Associates), and G. L. Lasseter (Inform. Res. Associates) Nov. 1974

M-FS-22910

Software package takes as input FORTRAN program which may contain many modules (subroutines and functions). Main parts: (1) FORTRAN front end gathers information about input program and (2) set of routines organized as diagnostic package evaluates information and prints warning messages concerning actual or potential errors.

B74-10203

COMPUTER PROGRAM FOR BUCKLING LOADS OF ORTHOTROPIC LAMINATED STIFFENED PANELS SUBJEC-TED TO BIAXIAL IN-PLACE LOADS (BUCLASP 2)

A. V. Viswanathan (Boeing Co.) and M. Tamekuni (Boeing Co.). Nov. 1974

LANGLEY-11199

General-purpose program performs exact instability analyses for structures such as unidirectionally-stiffened, rectangular composite panels. Program was written in FORTRAN IV and COMPASS for CDC-series computers.

B74-10204

COMPUTER PROGRAM FOR STRESSES AND BUCKLING OF HEATED COMPOSITE-STIFFENED PANELS AND OTHER-STRUCTURES (BUCLASP 3)

A. V. Viswanathan (Boeing Co.), M. Tamekuni (Boeing Co.), and L. L. Tripp (Boeing Co.) Nov. 1974

LANGLEY-11533

General-purpose program is intended for thermal stress and instability analyses of structures such as axially-stiffened curved panels. Two types of instability analyses can be effected by program: (1) thermal buckling with temperature variation as specified and (2) buckling due to in-plane biaxial loading.

COMPUTER PROGRAM FOR STRESS, STABILITY, AND VIBRATION OF COMPLEX BRANCHED SHELLS OF REVOLUTION: BOSOR 4

D. Bushnell (Lockheed Missiles and Space Co.)

Nov. 1974

LANGLEY-11209

Code is easy to use yet is general with respect to: (a) type of analysis to be performed; (b) geometry of shell meridian; (c) type of wall construction; (d) type of boundary conditions, ring supports, and branching configuration; and (e) type of loading.

COMPUTER PROGRAM FOR STEAMTUBE CURVATURE ANALYSIS: ANALYTICAL METHOD

D. R. Ferguson (GE), P. H. Heck (GE), J. S. Keith (GE), D. J. Lahti (GE), and C. L. Merkle (GE)

Nov. 1974

LANGLEY-11535

Program provides design information for low-drag, high-dragdivergence, Mach number isolated nacelles suitable for use with advanced high-bypass-ratio, turbofan engines. One element is development of method to predict inviscid pressure distribution and flow field about arbitrary axisymmetric ducted body at transonic speeds.

B74-10207

INVESTIGATION OF EXIT-VELOCITY STRATIFICATION EFFECTS ON JETS IN A CROSSFLOW (STRJET)

H. Ziegler (Northrop Corp.)

Nov. 1974

LANGLEY-11581

Program determines flow field about jets with velocity stratification exhausting into crossflow. Jets with three different types of exit-velocity stratification have been considered: (a) jets with relatively high-velocity core, (b) jets with relatively low-velocity core, and (c) jets originating from vaned nozzle.

B74-10215

EIGENVALUE ALGORITHM BASED ON A COMBINED STURM SEQUENCE AND INVERSE ITERATION TECHNIQUE (EASI)

K. K. Gupta Nov. 1974 NPO-13368

Desired roots are first isolated by Sturm sequence procedure. Then special variant of inverse iteration technique is applied for individual determination of each root along with its vector. Program was written in FORTRAN V for UNIVAC 1100-series computers.

B74-10221

CALCULATION OF AERODYNAMIC CHARACTERISTICS OF STOL AIRCRAFT

M. F. E. Dillenius (Nielson Eng. and Res., Inc.), M. R. Mendenhall (Nielson Eng. and Res., Inc.), and S. B. Spangler (Nielson Eng. and Res., Inc.)

Nov. 1974 ARC-10882

Method predicts lift and pitching moment characteristics of STOL aircraft with externally-blown, jet-augmented wing-flap combinations using potential-flow approach which involves combination of two flow models. Method can accommodate multiple engines per wing panel and part-span flaps.

B74-10225

COMPUTERIZED LOGIC DESIGN OF DIGITAL CIRCUITS S. Gussow (Sperry Rand Corp.) and R. Oglesby (Sperry Rand Corp.)

Nov. 1974

M-FS-22401

Procedure performs all work required for logic design of digital counters or sequential circuits and simplification of Boolean expressions. Program provides simple, accurate, and comprehensive logic design capability to users both experienced and totally inexperienced in logic design

374-10236

NUMERICAL PROGRAM FOR ANALYSIS OF THREE-DIMENSIONAL SUPERSONIC EXHAUST FLOW FIELDS (CHAR 3D)

S. Dash (Advanced Technol. Labs., Inc.), P. Del Guidice (Advanced Technol. Labs., Inc.), A. Ferri (Advanced Technol. Labs., Inc.), and G. Roffe (Advanced Technol. Labs., Inc.)
Dec. 1974

LANGLEY-11596

Choice of reference plane orientation depends on specific nozzle geometry, with different configurations requiring different reference plane systems. In addition, for given configuration several reference systems may be used in different regions of flow field, so each system is locally aligned with flow.

B74-10279

AUTOMATED MAINTENANCE FOR COMPLEX HYBRID SYSTEMS

G. C. Gilley Jan. 1975

NPO-13143

Digital computer, Control Computer Subsystem (CCS), possess high degree of fault tolerance. CCS embodies concepts of self-test and repair. It is capable of monitoring its own performance and of identifying and replacing with standby spare any of its units that fail.

SUBJECT INDEX

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fanscan technique MSC-14632 B74-10153 05 ARC-10827 B74-10198 02 BACKGROUND NOISE ANTISKID DEVICES ATTITUDE CONTROL Coaxial anode improves sensitivity of gas Antiskid braking system Magnetic bearings with combined radial radiation counters M-FS-22807 B74-10146 06 GSFC-11492 B74-10229 03 and axial control ARC DISCHARGES GSFC-11551 B74-10131 06 **BACTERIA** Self-protected Magnetic-heading reference device electrodes limit Improved methods for counting bacteria field-emission current LANGLEY-11387 B74-10176 02 in physiological fluids ERC-10015 B74-10253 01 Pulse-width-modulated servo valve for GSFC-11917 B74-10231 05 ARC LAMPS autopilot system BACTERICIDES Casting copper LANGLEY-11643 874-10179 06 to tungsten for Polyelectrolytes hiah charge high-power arc lamp cathodes **AUDIO EQUIPMENT** density LEWIS-12169 B74-10011 04 Radio-controlled, sound-operated switch NPO-11918 B74-10159 04 ARGON LANGLEY-11641 B74-10143 03 BACTERIOLOGY Casting copper to tungsten for **AUDITORY SIGNALS** Automated single-slide staining system high-power arc lamp cathodes Radio-controlled, sound-operated switch LANGLEY-11649 B74-10188 05 LFWIS-12169 B74-10011 04 LANGLEY-11641 B74-10143 03 RAFFIES ARMOR **AUTOCLAVING** Moisture-resistant baffle material for fuel Controlled intermittent interfacial bond Fabrication of complex structures or tanks concept for composite materials assemblies by hot isostatic pressure (HIP) ARC-10861 B74-10219 04 LANGLEY-11628 B74-10264 04 welding **BALL BEARINGS** ARRAYS B74-10124 04 LEWIS-11490 Lightweight, high speed bearing balls: Thermoelastic analysis of solar cell arrays **AUTOMATIC CONTROL** A concept and their material properties Throttleable heat pipe LEWIS-11087 B74-10013 06 NPO-13458 B74-10301 03 B74-10173 03 ARC-10848 **BALLISTICS ASSEMBLING** Swashplate feedback control for tilt-rotor Laser-scanning techniques for rapid Expandable space frames aircraft ballistics identification ERC-10365 B74-10252 06 ARC-10854 B74-10174 06 NPO-11861 B74-10102 03 Flange design for large-scale modular Automatic soldering machine **BANDPASS FILTERS** assembly jigs MSC-19401 B74-10193 06 High q band-pass resonators utilizing MSC-19372 B74-10273 06 composite band-stop resonator pairs Automated maintenance for complex ASSEMBLY LANGUAGE GSFC-10990 B74-10035 02 hybrid systems Graphics shadowing analysis NPO-13143 B74-10279 09 **BANDWIDTH** M-FS-21406 B74-10040 09 Low cost instrumentation amplifier **AUTOMATIC CONTROL VALVES** Marshall information retrieval and display LEWIS-12222 B74-10015 01 Programmed-pressure air supply for system (MIRADS) positive-pressure breathing system **BATTERY CHARGERS** M-FS-22536 B74-10043 09 B74-10075 05 Radioisotope thermal generator (RTG) ARC-10845 Generalized curve fit and plotting power conditioner **AUTOMATIC FREQUENCY CONTROL** (GECAP) program B74-10022 03 LANGLEY-11313 Minicomputer-controlled M-FS-22728 frequency R74-10044 09 Solar array deployment from a spinning generator **ASTRONOMY** spacecraft NPO-11962 B74-10163 02 Digital multichannel photometer ARC-10787 B74-10048 06 HQ-10791 B74-10200 03 **AUTOMATIC PILOTS** Battery activation system Magnetic-heading reference device **ASTROPHYSICS** ARC-10832 B74-10056-03 B74-10176 02 Method for remotely sensing turbulence LANGLEY-11387 BEARING (DIRECTION) of planetary atmospheres Pulse-width-modulated servo valve for Bidirectional zoom antenna NPO-13154 B74-10168 03 autopilot system B74-10257 01 GSFC-11862 ATMOSPHERIC COMPOSITION LANGLEY-11643 B74-10179 06 Extendible probe for atmosphere **AUTOMOBILES** Plasma-sprayed metal-glass fluoride sampling Short-range laser obstacle detector coatings for lubrication to 1170 K (1650 ARC-10829 B74-10054 03 NPO-11856 B74-10101 03 ATMOSPHERIC ENTRY Location of vehicles using AM station LEWIS-11930 B74-10016 04 Volume-reflecting dielectric heat shield broadcasting signals ARC-10803 B74-10074 04 Computer program for flexible rotor NPO-13217 B74-10300 02 dynamics analysis ATMOSPHERIC TURBULENCE **AXIAL FLOW PUMPS** LEWIS-12153 B74-10084 09 Method for remotely sensing turbulence Data summary and computer program Design criteria monograph for valve of planetary atmospheres for axial-flow pump rotor performance NPO-13154 components B74-10168 03 LEWIS-11920 B74-10127 09 **ATMOSPHERICS** LEWIS-12327 B74-10087 06 Color-coded area sensitivity maps of **AXIAL STRAIN** Magnetic bearings with combined radial photomultipliers Miniature biaxial strain transducer and axial control LANGLEY-10320 B74-10259 01 B74-10131 06 LANGLEY-11648 B74-10180 01 GSFC-11551

magnetic **BREATHING APPARATUS** Improved suspension Improved methods for counting bacteria Silver oxide sorbent for carbon dioxide technique in physiological fluids B74-10231 05 ARC-10797 B74-10053 04 GSFC-11079 B74-10254 03 GSFC-11917 BENDING **BLOOD PRESSURE** Programmed-pressure air supply for, Suppression of bending motion in elastic positive-pressure breathing system Compact telemetry package for remote B74-10075 05 bodies ARC-10845 monitoring of neutron responses in B74-10070 06 XAC-05632 animals **BRITTLE MATERIALS BESSEL FUNCTIONS** NPO-11887 B74-10103 05 Fabrication of complex structures or Zeros of certain cross products of Bessel **BLOWERS** assemblies by hot isostatic pressure (HIP) functions of fractional order Data summary and computer program welding B74-10012 03 LEWIS-12221 LEWIS-11490 B74-10124 04 for axial-flow pump rotor performance BINARY MIXTURES B74-10127 09 LEWIS-11920 **BRITTLENESS** Binary for allovs refractory-metal **BOARDS (PAPER)** High-strength alloy with resistance to brazing Alinement fixture for precision cutting hydrogen-environment embrittlement LEWIS-12184 B74-10125 08 of printed-wiring boards M-FS-19234 B74-10265 04 BIOASSAY LANGLEY-11658 B74-10290 01 BUCKLING Methods for improved resolution of flow **BODY FLUIDS** Computer program for buckling loads of electrophoresis cells Liquid sample processor orthotropic laminated stiffened panels M-FS-22223 B74-10032 04 NPO-13136 B74-10278 05 subjected - to biaxial in-place loads Improved methods for counting bacteria (BUCLASP 2) **BODY TEMPERATURE** in physiological fluids B74-10203 09 LANGLEY-11199 Compact telemetry package for remote GSFC-11917 B74-10231 05 monitoring of neutron responses Computer program for stress, stability, Micro-organism distribution sampling for animals and vibration of complex branched shells bioassavs NPO-11887 B74-10103 05 of revolution: BOSOR 4 LANGLEY-10789 B74-10289 05 LANGLEY-11209 B74-10205 09 BONDING BIOCHEMISTRY Glass fiber addition strengthens Enzymatic regeneration of adenosine low-density ablative compositions triphosphate cofactor LANGLEY-11288 B74-10027 04 ARC-10837 B74-10057 04 C Fabrication of complex structures or Polyelectrolytes with hiah charge assemblies by hot isostatic pressure (HIP) density CALIBRATING NPO-11918 B74-10159 04 welding Three-point bridge calibration with one LEWIS-11490 **BIOINSTRUMENTATION** B74-10124 04 resistor Controlled intermittent interfacial bond Automated monitoring of recovered ARC-10762 B74-10047 01 water quality concept for composite materials Compact source of soft X-rays LANGLEY-11203 B74-10029 05 LANGLEY-11628 B74-10264 04 HQ-10732 B74-10232 03 Bio-isolated DC New insulation attachment method operational amplifier CAMERAS ARC-10596 B74-10112 01 eliminates compatibility bondline stresses Thermistor holder for skin-temperature MSC-12615 B74-10269 07 Vertical copy camera system provides photographs from erts-1 imagery measurements BONES LEWIS-12140 B74-10009 07 ARC-10855 B74-10119 05 In vivo measurement of mechanical Finger recording electrode system for Viewgraph preparation made easier impedance of bone electrical impedance plethysmograph LANGLEY-11612 B74-10094 03 ARC-10857 B74-10245 05 Optical discriminator system ARC-10816 B74-10172 05 RORON Reference - apparatus for medical Radiation hardening of metal-oxide LANGLEY-11580 B74-10139 03 ultrasonic transducer semiconductor (MOS) devices by boron CAMS ARC-10753 B74-10197 01 B74-10026 01 GSFC-11425 Programmed-pressure air supply for **BOROSILICATE GLASS** In vivo measurement of mechanical positive-pressure breathing system addition impedance of bone Glass fiber strengthens ARC-10845 B74-10075 05 ARC-10857 B74-10245 05 low-density ablative compositions CAŃCER LANGLEY-11288 B74-10027 04 **BIOLOGICAL EFFECTS** A high yield neutron target Low-temperture electrostatic In vivo measurement of mechanical LEWIS-12058 B74-10066 03 silicon-to-silicon seals using sputtered impedance of bone Polyelectrolytes with high charge borosilicate glass ARC-10857 B74-10245 05 density LANGLEY-11589 B74-10263 08 BIOLUMINESCENCE NPO-11918 B74-10159 04 **BOUNDARY LAYER FLOW** Improved methods for counting bacteria CAPACITANCE Computer program for calculating in physiological fluids Improved capacitance multiplier circuit transitional. and laminar. turbulent GSFC-11917 B74-10231 05 NPO-11948 B74-10162 02 boundary lavers for compressible а **BIOTELEMETRY** CAPACITORS axisymmetric flow Time-control system for communication Thin-film temperature sensor B74-10129 09 LEWIS-12178 between data-collection and orbiting B74-10100 01 NPO-11775 **BOUNDARY LAYER SEPARATION** GSFC-11182 B74-10088 02 Improved fabrication Computer program for steamtube of electrolytic Compact telemetry package for remote curvature analysis: Analytical method capacitors monitoring of neutron responses LANGLEY-11535 B74-10206 09 M-FS-23133 B74-10294 01 animals BRAKES (FOR ARRESTING MOTION) CAPILLARY FLOW NPO-11887 B74-10103 05 Brake for rollable platform Liquid-cooled liner for helmets Heart-rate pulse-shift detector B74-10045 06 ARC-10512 ARC-10534 B74-10249 05 ARC-10729 B74-10196 01 Antiskid braking system **CARBON** BLADES M-FS-22807 B74-10146 06 Graphite ionization vacuum gauge Computer for calculating program BRAZING LANGLEY-11338 B74-10136 03 velocities and streamlines on mid-channel In-process oxidation protection in fluxless CARBON DIOXIDE REMOVAL flow surface of axial or mixed-flow brazing or diffusion bonding of aluminum turbomachine Silver oxide sorbent for carbon dioxide alloys LEWIS-12129 B74-10130 09 ARC-10797 B74-10053 04 MSC-14435 B74-10096 04 BLOOD Binary CARBON MONOXIDE allovs refractory-metal for Automated drug identification system brazing Carbon monoxide detector NPO-13063 LEWIS-12184 B74-10213 05 B74-10125 08 M-FS-23090 B74-10268 04 Computer program for predicting

Electrometer

nanoamps at high voltage

system

measures

CENTRIFUGAL COMPRESSORS

CARBON STEELS

Lightweight, high speed bearing balls:

Lightweight, high speed bearing balls:	Computer program for predicting	LEWIS-12267 B74-10064 01
A concept LEWIS-11087 B74-10013 06	off-design performance of centrifugal compressors	
	LEWIS-12186 B74-10067 09	Self-protecting solid state isolated
CASSEGRAIN ANTENNAS Variable-beamwidth antennas	CENTRIFUGAL PUMPS	switch LEWIS-12268 B74-10069 01
GSFC-11760 B74-10041 02	Design criteria monograph on centrifugal	
	flow turbopumps	Electronic high pass filter LEWIS-11600 B74-10083 02
CASTING	LEWIS-12346 B74-10228 06	
Casting copper to tungsten for	CENTRIFUGING	Generalized current distribution rule
high-power arc lamp cathodes	Two-phase, passive separator-and-filter	LANGLEY-11565 B74-10093 02
LEWIS-12169 B74-10011 04	assembly	Pocket-size microwave radiation hazard
Control of elasticity in cast elastomeric	LANGLEY-10976 B74-10133 04	detector
shock/vibration isolators	CERAMICS	NPO-11461 B74-10097 02
KSC-10850 B74-10039 07	Process for fabrication of stabilized	Frequency discriminator/phase detector
CATHODE RAY TUBES	aluminum phosphate fibers	NPO-11515 B74-10098 02
Graphics shadowing analysis	LANGLEY-11526 B74-10185 08	Decimal digit generator for commutated
M-FS-21406 B74-10040 09	High-temperature tensile tester for	data: A Concept
CATHODES	ceramics	ARC-10856 B74-10120 01
Casting copper to tungsten for	ARC-10822 B74-10244 04	Improved capacitance multiplier circuit
high-power arc lamp cathodes	CHARGED PARTICLES	NPO-11948 B74-10162 02
LEWIS-12169 B74-10011 04	Particle impact location detector	Advanced-priority interrupt module
Self-protected electrodes limit	GSFC-11829 B74-10230 03	NPO-13067 B74-10165 02
field-emission current		Wide deviation phase modulator
ERC-10015 B74-10253 01	Improved channel multiplier for radiation-and-particle detectors	LANGLEY-11607 B74-10178 02
CAVITATION FLOW	NPO-12128 B74-10275 03	Reduction of quantization error in
Process to restore obliterated serial		measurement of frequency
numbers on metal surfaces	CHECKOUT	MSC-14649 B74-10191 02
LEWIS-12085 B74-10020 07	FORTRAN automatic code evaluation system (FACES)	Heart-rate pulse-shift detector
CDC COMPUTERS	M-FS-22910 B74-10190 09	ARC-10729 B74-10196 01
Computer program for buckling loads of		Digital multichannel photometer
orthotropic laminated stiffened panels	CHEMICAL ANALYSIS	HQ-10791 B74-10200 03
subjected to biaxial in-place loads	Liquid sample processor NPO-13136 874-10278 05	Phased-array antenna phase control
(BUCLASP 2)		circuit using frequency multiplication ERC-10285 B74-10251 01
LANGLEY-11199 B74-10203 09	CHEMICAL CLEANING	Digital second-order phase-locked loop
CDC 3600 COMPUTER	In-process oxidation protection in fluxless brazing or diffusion bonding of aluminum	NPO-11905 B74-10274 01
Computer program for calculating water	3	Reliability data for electronic and
and steam properties	alloys MSC-14435 B74-10096 04	electromechanical components: A report
LEWIS-12206 B74-10123 09		NPO-13153 B74-10280 01
CDC 6000 SERIES COMPUTERS	CHEMICAL STERILIZATION	CIRCULAR POLARIZATION
	lodine generator for disinfecting	
Prediction of unsteady aerodynamic	reclaimed water	Improved circularly polarized antenna
Prediction of unsteady aerodynamic loadings caused by trailing-edge	reclaimed water MSC-14632 B74-10153 05	Improved circularly polarized antenna ERC-10214 B74-10250 02
Prediction of unsteady aerodynamic loadings caused by trailing-edge control-surface motions in subsonic	reclaimed water MSC-14632 CHEMICAL TESTS B74-10153 05	Improved circularly polarized antenna ERC-10214 B74-10250 02 Low-loss, circularly-polarized dichroic
Prediction of unsteady aerodynamic loadings caused by trailing-edge	reclaimed water MSC-14632 B74-10153 05 CHEMICAL TESTS Automated monitoring of recovered	Improved circularly polarized antenna ERC-10214 B74-10250 02
Prediction of unsteady aerodynamic loadings caused by trailing-edge control-surface motions in subsonic compressible flow LANGLEY-11175 B74-10091 06	reclaimed water MSC-14632 B74-10153 05 CHEMICAL TESTS Automated monitoring of recovered water quality	Improved circularly polarized antenna ERC-10214 B74-10250 02 Low-loss, circularly-polarized dichroic plate
Prediction of unsteady aerodynamic loadings caused by trailing-edge control-surface motions in subsonic compressible flow LANGLEY-11175 B74-10091 06 Computer program for structural analysis	reclaimed water MSC-14632 CHEMICAL TESTS Automated monitoring of recovered water quality LANGLEY-11203 B74-10029 05	Improved circularly polarized antenna ERC-10214 B74-10250 02 Low-loss, circularly-polarized dichroic plate NPO-13171 B74-10283 01
Prediction of unsteady aerodynamic loadings caused by trailing-edge control-surface motions in subsonic compressible flow LANGLEY-11175 B74-10091 06	reclaimed water MSC-14632 CHEMICAL TESTS Automated monitoring of recovered water quality LANGLEY-11203 CHEMILUMINESCENCE	Improved circularly polarized antenna B74-10250 02 Low-loss, circularly-polarized dichroic plate NPO-13171 B74-10283 01 CLAMPS
Prediction of unsteady aerodynamic loadings caused by trailing-edge control-surface motions in subsonic compressible flow LANGLEY-11175 B74-10091 06 Computer program for structural analysis of layered orthotropic ring-stiffened shells	reclaimed water MSC-14632 CHEMICAL TESTS Automated monitoring of recovered water quality LANGLEY-11203 CHEMILUMINESCENCE Automated monitoring of recovered	Improved circularly polarized antenna ERC-10214 B74-10250 02 Low-loss, circularly-polarized dichroic plate NPO-13171 B74-10283 01 CLAMPS A band clamp with a spring toggle
Prediction of unsteady aerodynamic loadings caused by trailing-edge control-surface motions in subsonic compressible flow LANGLEY-11175 B74-10091 06 Computer program for structural analysis of layered orthotropic ring-stiffened shells of revolution (SALORS): Linear stress	reclaimed water MSC-14632 CHEMICAL TESTS Automated monitoring of recovered water quality LANGLEY-11203 CHEMILUMINESCENCE Automated monitoring of recovered water quality	Improved circularly polarized antenna ERC-10214 B74-10250 02 Low-loss, circularly-polarized dichroic plate NPO-13171 B74-10283 01 CLAMPS A band clamp with a spring toggle lever
Prediction of unsteady aerodynamic loadings caused by trailing-edge control-surface motions in subsonic compressible flow LANGLEY-11175 B74-10091 06 Computer program for structural analysis of layered orthotropic ring-stiffened shells of revolution (SALORS): Linear stress analysis option LANGLEY-11569 B74-10186 09	reclaimed water MSC-14632 CHEMICAL TESTS Automated monitoring of recovered water quality LANGLEY-11203 CHEMILUMINESCENCE Automated monitoring of recovered water quality LANGLEY-11203 B74-10029 D5	Improved circularly polarized antenna ERC-10214 B74-10250 02 Low-loss, circularly-polarized dichroic plate NPO-13171 B74-10283 01 CLAMPS A band clamp with a spring toggle lever MSC-14736 B74-10240 07
Prediction of unsteady aerodynamic loadings caused by trailing-edge control-surface motions in subsonic compressible flow LANGLEY-11175 B74-10091 06 Computer program for structural analysis of layered orthotropic ring-stiffened shells of revolution (SALORS): Linear stress analysis option LANGLEY-11569 B74-10186 09 Computer program for stresses and	reclaimed water MSC-14632 CHEMICAL TESTS Automated monitoring of recovered water quality LANGLEY-11203 CHEMILUMINESCENCE Automated monitoring of recovered water quality LANGLEY-11203 B74-10029 05 CHROMATOGRAPHY	Improved circularly polarized antenna ERC-10214 B74-10250 02 Low-loss, circularly-polarized dichroic plate NPO-13171 B74-10283 01 CLAMPS A band clamp with a spring toggle lever MSC-14736 B74-10240 07 CLINICAL MEDICINE
Prediction of unsteady aerodynamic loadings caused by trailing-edge control-surface motions in subsonic compressible flow LANGLEY-11175 B74-10091 06 Computer program for structural analysis of layered orthotropic ring-stiffened shells of revolution (SALORS): Linear stress analysis option LANGLEY-11569 B74-10186 09	reclaimed water MSC-14632 CHEMICAL TESTS Automated monitoring of recovered water quality LANGLEY-11203 CHEMILUMINESCENCE Automated monitoring of recovered water quality LANGLEY-11203 CHEMILUMINESCENCE Automated monitoring of recovered water quality LANGLEY-11203 CHROMATOGRAPHY Automated drug identification system	Improved circularly polarized antenna ERC-10214 B74-10250 02 Low-loss, circularly-polarized dichroic plate NPO-13171 B74-10283 01 CLAMPS A band clamp with a spring toggle lever MSC-14736 B74-10240 07 CLINICAL MEDICINE Automated single-slide staining system LANGLEY-11649 B74-10188 05 Automated drug identification system
Prediction of unsteady aerodynamic loadings caused by trailing-edge control-surface motions in subsonic compressible flow LANGLEY-11175 B74-10091 06 Computer program for structural analysis of layered orthotropic ring-stiffened shells of revolution (SALORS): Linear stress analysis option LANGLEY-11569 B74-10186 09 Computer program for stresses and buckling of heated composite-stiffened	reclaimed water MSC-14632 CHEMICAL TESTS Automated monitoring of recovered water quality LANGLEY-11203 CHEMILUMINESCENCE Automated monitoring of recovered water quality LANGLEY-11203 CHROMATOGRAPHY Automated drug identification system NPO-13063 B74-10213 05	Improved circularly polarized antenna ERC-10214 B74-10250 02 Low-loss, circularly-polarized dichroic plate NPO-13171 B74-10283 01 CLAMPS A band clamp with a spring toggle lever MSC-14736 B74-10240 07 CLINICAL MEDICINE Automated single-slide staining system LANGLEY-11649 B74-10188 05 Automated drug identification system NPO-13063 B74-10213 05
Prediction of unsteady aerodynamic loadings caused by trailing-edge control-surface motions in subsonic compressible flow LANGLEY-11175 B74-10091 06 Computer program for structural analysis of layered orthotropic ring-stiffened shells of revolution (SALORS): Linear stress analysis option LANGLEY-11569 B74-10186 09 Computer program for stresses and buckling of heated composite-stiffened panels and other structures (BUCLASP 3) LANGLEY-11533 B74-10204 09	reclaimed water MSC-14632 CHEMICAL TESTS Automated monitoring of recovered water quality LANGLEY-11203 CHEMILUMINESCENCE Automated monitoring of recovered water quality LANGLEY-11203 CHROMATOGRAPHY Automated drug identification system NPO-13063 CHROMIUM	Improved circularly polarized antenna ERC-10214 B74-10250 02 Low-loss, circularly-polarized dichroic plate NPO-13171 B74-10283 01 CLAMPS A band clamp with a spring toggle lever MSC-14736 B74-10240 07 CLINICAL MEDICINE Automated single-slide staining system LANGLEY-11649 B74-10188 05 Automated drug identification system NPO-13063 B74-10213 05 CLOSED CIRCUIT TELEVISION
Prediction of unsteady aerodynamic loadings caused by trailing-edge control-surface motions in subsonic compressible flow LANGLEY-11175 B74-10091 06 Computer program for structural analysis of layered orthotropic ring-stiffened shells of revolution (SALORS): Linear stress analysis option LANGLEY-11569 B74-10186 09 Computer program for stresses and buckling of heated composite-stiffened panels and other structures (BUCLASP 3)	reclaimed water MSC-14632 CHEMICAL TESTS Automated monitoring of recovered water quality LANGLEY-11203 CHEMILUMINESCENCE Automated monitoring of recovered water quality LANGLEY-11203 B74-10029 05 CHROMATOGRAPHY Automated drug identification system NPO-13063 CHROMIUM Commercially available black chrome is	Improved circularly polarized antenna ERC-10214 B74-10250 02 Low-loss, circularly-polarized dichroic plate NPO-13171 B74-10283 01 CLAMPS A band clamp with a spring toggle lever MSC-14736 B74-10240 07 CLINICAL MEDICINE Automated single-slide staining system LANGLEY-11649 B74-10188 05 Automated drug identification system NPO-13063 B74-10213 05 CLOSED CIRCUIT TELEVISION Closed-circuit-television welding-elec-
Prediction of unsteady aerodynamic loadings caused by trailing-edge control-surface motions in subsonic compressible flow LANGLEY-11175 B74-10091 06 Computer program for structural analysis of layered orthotropic ring-stiffened shells of revolution (SALORS): Linear stress analysis option LANGLEY-11569 B74-10186 09 Computer program for stresses and buckling of heated composite-stiffened panels and other structures (BUCLASP 3) LANGLEY-11533 B74-10204 09 Computer program for stress, stability,	reclaimed water MSC-14632 CHEMICAL TESTS Automated monitoring of recovered water quality LANGLEY-11203 CHEMILUMINESCENCE Automated monitoring of recovered water quality LANGLEY-11203 CHROMATOGRAPHY Automated drug identification system NPO-13063 CHROMIUM Commercially available black chrome is an effective solar collector coating	Improved circularly polarized antenna ERC-10214 B74-10250 02 Low-loss, circularly-polarized dichroic plate NPO-13171 B74-10283 01 CLAMPS A band clamp with a spring toggle lever MSC-14736 B74-10240 07 CLINICAL MEDICINE Automated single-slide staining system LANGLEY-11649 B74-10188 05 Automated drug identification system NPO-13063 B74-10213 05 CLOSED CIRCUIT TELEVISION Closed-circuit-television welding-electrode guidance system
Prediction of unsteady aerodynamic loadings caused by trailing-edge control-surface motions in subsonic compressible flow LANGLEY-11175 B74-10091 06 Computer program for structural analysis of layered orthotropic ring-stiffened shells of revolution (SALORS): Linear stress analysis option LANGLEY-11569 B74-10186 09 Computer program for stresses and buckling of heated composite-stiffened panels and other structures (BUCLASP 3) LANGLEY-11533 B74-10204 09 Computer program for stress, stability, and vibration of complex branched shells	reclaimed water MSC-14632 CHEMICAL TESTS Automated monitoring of recovered water quality LANGLEY-11203 CHEMILUMINESCENCE Automated monitoring of recovered water quality LANGLEY-11203 CHROMATOGRAPHY Automated drug identification system NPO-13063 CHROMIUM Commercially available black chrome is an effective solar collector coating LEWIS-12159 B74-10121 04	Improved circularly polarized antenna ERC-10214 B74-10250 02 Low-loss, circularly-polarized dichroic plate NPO-13171 B74-10283 01 CLAMPS A band clamp with a spring toggle lever MSC-14736 B74-10240 07 CLINICAL MEDICINE Automated single-slide staining system LANGLEY-11649 B74-10188 05 Automated drug identification system NPO-13063 B74-10213 05 CLOSED CIRCUIT TELEVISION Closed-circuit-television welding-electrode guidance system M-FS-23026 B74-10150 02
Prediction of unsteady aerodynamic loadings caused by trailing-edge control-surface motions in subsonic compressible flow LANGLEY-11175 B74-10091 06 Computer program for structural analysis of layered orthotropic ring-stiffened shells of revolution (SALORS): Linear stress analysis option LANGLEY-11569 B74-10186 09 Computer program for stresses and buckling of heated composite-stiffened panels and other structures (BUCLASP 3) LANGLEY-11533 B74-10204 09 Computer program for stress, stability, and vibration of complex branched shells of revolution: BOSOR 4 LANGLEY-11209 B74-10205 09	reclaimed water MSC-14632 CHEMICAL TESTS Automated monitoring of recovered water quality LANGLEY-11203 CHEMILUMINESCENCE Automated monitoring of recovered water quality LANGLEY-11203 CHROMATOGRAPHY Automated drug identification system NPO-13063 CHROMIUM Commercially available black chrome is an effective solar collector coating LEWIS-12159 B74-10121 04 CIRCUIT BOARDS	Improved circularly polarized antenna ERC-10214 B74-10250 02 Low-loss, circularly-polarized dichroic plate NPO-13171 B74-10283 01 CLAMPS A band clamp with a spring toggle lever MSC-14736 B74-10240 07 CLINICAL MEDICINE Automated single-slide staining system LANGLEY-11649 B74-10188 05 Automated drug identification system NPO-13063 B74-10213 05 CLOSED CIRCUIT TELEVISION Closed-circuit-television welding-electrode guidance system M-FS-23026 B74-10150 02 CLOSED CYCLES
Prediction of unsteady aerodynamic loadings caused by trailing-edge control-surface motions in subsonic compressible flow LANGLEY-11175 B74-10091 06 Computer program for structural analysis of layered orthotropic ring-stiffened shells of revolution (SALORS): Linear stress analysis option LANGLEY-11569 B74-10186 09 Computer program for stresses and buckling of heated composite-stiffened panels and other structures (BUCLASP 3) LANGLEY-11533 B74-10204 09 Computer program for stress, stability, and vibration of complex branched shells of revolution: BOSOR 4 LANGLEY-11209 B74-10205 09	reclaimed water MSC-14632 CHEMICAL TESTS Automated monitoring of recovered water quality LANGLEY-11203 CHEMILUMINESCENCE Automated monitoring of recovered water quality LANGLEY-11203 CHROMATOGRAPHY Automated drug identification system NPO-13063 CHROMIUM Commercially available black chrome is an effective solar collector coating LEWIS-12159 CHROMIUS CIRCUIT BOARDS Improved circuit-board interconnectors	Improved circularly polarized antenna ERC-10214 B74-10250 02 Low-loss, circularly-polarized dichroic plate NPO-13171 B74-10283 01 CLAMPS A band clamp with a spring toggle lever MSC-14736 B74-10240 07 CLINICAL MEDICINE Automated single-slide staining system LANGLEY-11649 B74-10188 05 Automated drug identification system NPO-13063 B74-10213 05 CLOSED CIRCUIT TELEVISION Closed-circuit-television welding-electrode guidance system M-FS-23026 B74-10150 02 CLOSED CYCLES Digital second-order phase-locked loop
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Prediction of unsteady aerodynamic loadings caused by trailing-edge control-surface motions in subsonic compressible flow LANGLEY-11175 B74-10091 06 Computer program for structural analysis of layered orthotropic ring-stiffened shells of revolution (SALORS): Linear stress analysis option LANGLEY-11569 B74-10186 09 Computer program for stresses and buckling of heated composite-stiffened panels and other structures (BUCLASP 3) LANGLEY-11533 B74-10204 09 Computer program for stress, stability, and vibration of complex branched shells of revolution: BOSOR 4 LANGLEY-11209 B74-10205 09 Computer program for steamtube curvature analysis: Analytical method LANGLEY-11535 B74-10206 09 Investigation of exit-velocity stratification effects on jets in a crossflow (STRJET) LANGLEY-11581 B74-10207 09 Numerical program for analysis of three-dimensional supersonic exhaust flow	reclaimed water MSC-14632 CHEMICAL TESTS Automated monitoring of recovered water quality LANGLEY-11203 CHEMILUMINESCENCE Automated monitoring of recovered water quality LANGLEY-11203 CHROMATOGRAPHY Automated drug identification system NPO-13063 CHROMIUM Commercially available black chrome is an effective solar collector coating LEWIS-12159 CIRCUIT BOARDS Improved circuit-board interconnectors MSC-12661 CIRCUIT PROTECTION Self-healing fuse LEWIS-11964 Self-protecting solid state isolated switch LEWIS-12268 B74-10069 01 CIRCUITS	Improved circularly polarized antenna ERC-10214 B74-10250 02 Low-loss, circularly-polarized dichroic plate NPO-13171 B74-10283 01 CLAMPS A band clamp with a spring toggle lever MSC-14736 B74-10240 07 CLINICAL MEDICINE Automated single-slide staining system LANGLEY-11649 B74-10188 05 Automated drug identification system NPO-13063 B74-10213 05 CLOSED CIRCUIT TELEVISION Closed-circuit-television welding-electrode guidance system M-FS-23026 B74-10150 02 CLOSED CYCLES Digital second-order phase-locked loop NPO-11905 B74-10274 01 CLOTHING Liquid-cooled liner for helmets ARC-10534 B74-10249 05 COMMERCIALLY DICHORAL STAINGS Commercially available black chrome is an effective solar collector coating LEWIS-12159 B74-10121 04
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Prediction of unsteady aerodynamic loadings caused by trailing-edge control-surface motions in subsonic compressible flow LANGLEY-11175 B74-10091 06 Computer program for structural analysis of layered orthotropic ring-stiffened shells of revolution (SALORS): Linear stress analysis option LANGLEY-11569 B74-10186 09 Computer program for stresses and buckling of heated composite-stiffened panels and other structures (BUCLASP 3) LANGLEY-11533 B74-10204 09 Computer program for stress, stability, and vibration of complex branched shells of revolution: BOSOR 4 LANGLEY-11209 B74-10205 09 Computer program for steamtube curvature analysis: Analytical method LANGLEY-11535 B74-10206 09 Investigation of exit-velocity stratification effects on jets in a crossflow (STRJET) LANGLEY-11581 B74-10207 09 Numerical program for analysis of three-dimensional supersonic exhaust flow fields (CHAR 3D) LANGLEY-11596 B74-10236 09 CDC 6600 COMPUTER Computer program for calculating water	reclaimed water MSC-14632 CHEMICAL TESTS Automated monitoring of recovered water quality LANGLEY-11203 CHEMILUMINESCENCE Automated monitoring of recovered water quality LANGLEY-11203 CHROMATOGRAPHY Automated drug identification system NPO-13063 CHROMIUM Commercially available black chrome is an effective solar collector coating LEWIS-12159 CIRCUIT BOARDS Improved circuit-board interconnectors MSC-12661 CIRCUIT PROTECTION Self-healing fuse LEWIS-11964 Self-protecting solid state isolated switch LEWIS-12268 CIRCUITS Low cost instrumentation amplifier LEWIS-12222 B74-10015 01 Low-distortion receiver for bilevel, baseband PCM waveforms	Improved circularly polarized antenna ERC-10214 B74-10250 02 Low-loss, circularly-polarized dichroic plate NPO-13171 B74-10283 01 CLAMPS A band clamp with a spring toggle lever MSC-14736 B74-10240 07 CLINICAL MEDICINE Automated single-slide staining system LANGLEY-11649 B74-10188 05 Automated drug identification system NPO-13063 B74-10213 05 CLOSED CIRCUIT TELEVISION Closed-circuit-television welding-electrode guidance system M-FS-23026 B74-10150 02 CLOSED CYCLES Digital second-order phase-locked loop NPO-11905 B74-10274 01 CLOTHING Liquid-cooled liner for helmets ARC-10534 B74-10249 05 COATINGS Commercially available black chrome is an effective solar collector coating LEWIS-12159 B74-10121 04 Metallized polymeric foam material ARC-10860 B74-10218 04 COAXIAL CABLES Stable group delay cable
Prediction of unsteady aerodynamic loadings caused by trailing-edge control-surface motions in subsonic compressible flow LANGLEY-11175 B74-10091 06 Computer program for structural analysis of layered orthotropic ring-stiffened shells of revolution (SALORS): Linear stress analysis option LANGLEY-11569 B74-10186 09 Computer program for stresses and buckling of heated composite-stiffened panels and other structures (BUCLASP 3) LANGLEY-11533 B74-10204 09 Computer program for stress, stability, and vibration of complex branched shells of revolution: BOSOR 4 LANGLEY-11209 B74-10205 09 Computer program for steamtube curvature analysis: Analytical method LANGLEY-11535 B74-10206 09 Investigation of exit-velocity stratification effects on jets in a crossflow (STRJET) LANGLEY-11581 B74-10207 09 Numerical program for analysis of three-dimensional supersonic exhaust flow fields (CHAR 3D) LANGLEY-11596 B74-10236 09 CDC 6600 COMPUTER Computer program for calculating water and steam properties LEWIS-12206 B74-10123 09	reclaimed water MSC-14632 CHEMICAL TESTS Automated monitoring of recovered water quality LANGLEY-11203 CHEMILUMINESCENCE Automated monitoring of recovered water quality LANGLEY-11203 CHROMATOGRAPHY Automated drug identification system NPO-13063 CHROMIUM Commercially available black chrome is an effective solar collector coating LEWIS-12159 CHROUIT BOARDS Improved circuit-board interconnectors MSC-12661 CIRCUIT PROTECTION Self-healing fuse LEWIS-11964 Self-protecting solid state isolated switch LEWIS-12268 CIRCUITS Low cost instrumentation amplifier LEWIS-12222 B74-10015 01 Low-distortion receiver for bilevel,	Improved circularly polarized antenna ERC-10214 B74-10250 02 Low-loss, circularly-polarized dichroic plate NPO-13171 B74-10283 01 CLAMPS A band clamp with a spring toggle lever MSC-14736 B74-10240 07 CLINICAL MEDICINE Automated single-slide staining system LANGLEY-11649 B74-10188 05 Automated drug identification system NPO-13063 B74-10213 05 CLOSED CIRCUIT TELEVISION Closed-circuit-television welding-electrode guidance system M-FS-23026 B74-10150 02 CLOSED CYCLES Digital second-order phase-locked loop NPO-11905 B74-10274 01 CLOTHING Liquid-cooled liner for helmets ARC-10534 B74-10249 05 COATINGS Commercially available black chrome is an effective solar collector coating LEWIS-12159 B74-1012 04 Metallized polymeric foam material ARC-10860 B74-10218 04 COAXIAL CABLES Stable group delay cable NPO-13138 B74-10295 01
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COBOL SUBJECT INDEX

COBOL	Soft, thermally conductive material	Computer program for spacecraft-booster
Marshall information retrieval and display	LANGLEY-10850 B74-10132 04	separation spring selection, set
system (MIRADS)	Pressure application technique for	composition, and location determination
M-FS-22536 B74-10043 09	high-temperature composite fabrication	.GSFC-11616 B74-10037 09
COLLIMATORS	LANGLEY-11601 B74-10141 08	Graphics shadowing analysis
Variable-beamwidth antennas	Advanced fiber-composite hybridsA	M-FS-21406 B74-10040 09
GSFC-11760 B74-10041 02	new structural material	Marshall information retrieval and display
Acoustic-optic deflector telescope M-FS-23107 B74-10293 03	LEWIS-12118 B74-10247 04	system (MIRADS) M-FS-22536 B74-10043 09
COLLISION AVOIDANCE	Advanced tungsten fiber-reinforced	Generalized curve fit and plotting
Short-range laser obstacle detector	nickel superalloy	(GECAP) program
NPO-11856 B74-10101 03	LEWIS-12394 B74-10248 04	M-FS-22728 B74-10044 09
COLOR	Depositing spacing layers on magnetic film with liquid phase epitaxy	Measurement of temperature profiles in
Color-coded area sensitivity maps of	LANGLEY-11528 B74-10262 01	hot gases and flames
photomultipliers	Controlled intermittent interfacial bond	LEWIS-12055 B74-10060 03
LANGLEY-10320 B74-10259 01	concept for composite materials	Computer program for predicting
COMBUSTION PRODUCTS Combustion products generating and	LANGLEY-11628 B74-10264 04	off-design performance of centrifugal
metering device	COMPOSITE STRUCTURES	compressors LEWIS-12186 B74-10067 09
GSFC-11095 B74-10036 04	High _ strength,wire-reinforced -	Computer program for flexible rotor
COMBUSTION STABILITY	electroformed structures	dynamics analysis
Polymer compositions suitable for use	LEWIS-12087 874-10018 08	LEWIS-12153 B74-10084 09
in enriched oxygen atmospheres	COMPOSITION (PROPERTY)	Prediction of unsteady aerodynamic
MSC-14618 B74-10154 04	Micrometeoroid velocity-and-trajectory	loadings caused by trailing-edge
Flame resistant elastic elastomeric fiber	analyzer GSFC-11889 B74-10286 01	control-surface motions in subsonic
MSC-14331 B74-10157 04	COMPRESSED AIR	compressible flow
COMMUNICATION EQUIPMENT	Therapeutic hand-exercising device with	LANGLEY-11175 B74-10091 06
Traffic control system and method	cycling pressure value	Computation of aerodynamic interference
GSFC-10087 B74-10024 02	LANGLEY-11579 B74-10140 05	between lifting surfaces and lift- and
Variable-beamwidth antennas GSFC-11760 B74-10041 02	Ignition of sounding rocket motors with	cruise-fans ARC-10833 B74-10113 09
Very high voltage latching relay	hand-pumped air	Computer program for calculating water
LEWIS-12265 B74-10079 01	LANGLEY-11152 B74-10202 03	and steam properties
Anti-multipath digital signal detector	COMPRESSIBLE FLOW	LEWIS-12206 B74-10123 09
LANGLEY-11379 B74-10137 02	Prediction of unsteady aerodynamic	Data summary and computer program
COMMUTATION	loadings caused by trailing-edge control-surface motions in subsonic	for axial-flow pump rotor performance
Decimal digit generator for commutated	control-surface motions in subsonic compressible flow	LEWIS-11920 B74-10127 09
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ARC-10856 B74-10120 01	Computer program for calculating	speeds of rotating shafts
COMPARATOR CIRCUITS	laminar, transitional, and turbulent	LEWIS-11910 B74-10128 09
Synchronized frequency transposer	boundary layers for a compressible	Computer program for calculating
GSFC-11763 B74-10256 01	axisymmetric flow	laminar, transitional, and turbulent boundary layers for a compressible axisymmetric
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·	COMPRESSING	LEWIS-12178 B74-10129 09
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ARC-10802 B74-10243 03	ARC-10551 B74-10111 04	velocities and streamlines on mid-channel
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Prediction of unsteady aerodynamic	high-temperature composite fabrication	turbomachine
loadings caused by trailing-edge	LÄNGLEY-11601 B74-10141 08	LEWIS-12129 B74-10130 09
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Computer program for buckling loads of	off-design performançe of centrifugal	Separation dynamics of S-II derivative
orthotropic laminated stiffened panels	compressors	launch vehicle
subjected to biaxial in-place loads	LEWIS-12186 B74-10067 09	M-FS-24325 B74-10151 06
(BUCLASP 2)	COMPRESSOR ROTORS Data summary and computer program	Eigenfunction solution of damped
LANGLEY-11199 B74-10203 09	for axial-flow pump rotor performance ,	structural systems: DAMP
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NPO-13044 B74-10106 02 Dynamic polarization compensating	for applications up to 1033 K (1400 F)	of revolution (SALORS): Linear stress analysis option
system for optical communications	LEWIS-11827 B74-10002 04	LANGLEY-11569 B74-10186 09
receiver	COMPUTER DESIGN	Model optimization using statistical
GSFC-11782 B74-10182 03	Modular digital computer system	estimation
Digital second-order phase-locked loop	design M-FS-22935 B74-10034 09	M-FS-22873 B74-10189 09
NPO-11905 B74-10274 01	COMPUTER GRAPHICS	Computer program for buckling loads of
COMPONENTS	Graphics shadowing analysis	orthotropic laminated stiffened panels
Flange design for large-scale modular	M-FS-21406 B74-10040 09	subjected to biaxial in-place loads
assembly jigs	Generalized curve fit and plotting	(BUCLASP 2)
MSC-19372 B74-10273 06	(GECAP) program	LANGLEY-11199 B74-10203 09
COMPOSITE MATERIALS	M-FS-22728 B74-10044 09	Computer program for stresses and
Criteria for selecting resin matrices for		
		buckling of heated composite-stiffened
improved composite strength LEWIS-12057 B74-10005 04	Design standards for low-profile flanges M-FS-22708 B74-10033 09	panels and other structures (BUCLASP 3) LANGLEY-11533 B74-10204 09

SUBJECT INDEX CURVE FITTING

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on airfoil structure iteration technique (EASI) provides smooth uninterrupted surface Control vane for engine exhaust flow NPO-13368 B74-10215 09 LANGLEY-11570 B74-10138 06 B74-10270 08 MSC-12631 Calculation aerodynamic of CONTROL VALVES COWLINGS characteristics of STOL aircraft Design criteria monograph for pressure Reversed cowl-flap thrust augmentor ARC-10882 B74-10221 09 regulators, relief valves, check valves, burst ARC-10754 B74-10046 06 Computerized logic design of digital disks, and explosive valves CRACKS circuits B74-10010 07 LEWIS-12168 Holographic evaluation of fatigue cracks M-FS-22401 B74-10225 09 Shutoff and throttling valve by a compressive stress (HYSTERESIS) Numerical program for analysis of NPO-11951 R74-10105 07 technique three-dimensional supersonic exhaust flow MSC-14555 B74-10156 06 CONTROLLED ATMOSPHERES fields (CHAR 3D) Semipermanent sealing of leaks in high Spacecraft oxygen recovery system LANGLEY-11596 B74-10236 09 B74-10220 05 ARC-10868 vacuum systems Thermoelastic analysis of solar cell arrays Environmental control ARC-10881 B74-10175 04 and waste and their material properties **CRITERIA** management system design concept NPO-13458 B74-10301 03 Design criteria monograph for valve B74-10235 06 LANGLEY-11588 **COMPUTER STORAGE DEVICES** components CONTROLLERS Modular digital computer system Heat-transfer thermal switch LEWIS-12327 B74-10087 06 design B74-10092 06 LANGLEY-11232 Design criteria monograph for valve M-FS-22935 B74-10034 09 assemblies CONVERGENCE High-speed fault-tolerant telemetry/ LEWIS-12332 B74-10227 06 Combined effects of a converging beam computer interface Design criteria monograph on centrifugal light and mirror misalignment in NPO-13139 B74-10296 02 michelson interferometry flow turbopumps **COMPUTER TECHNIQUES** ARC-10889 B74-10246 03 LEWIS-12346 B74-10228 06 Facility for testing solar cells CRITICAL VELOCITY **COOLING SYSTEMS** B74-10099 02 NPO-11761 Improved thermal isolation for Computer program for calculating critical COMPUTERIZED DESIGN speeds of rotating shafts superconducting magnet systems Design standards for low-profile flanges 874-10158 02 LEWIS-11910 B74-10128 09 NPO-11875 M-FS-22708 B74-10033 09 Electrostatically controlled heat shutter **CROSS COUPLING** Computerized logic design of digital NPO-11942 B74-10161 03 Low-loss, circularly-polarized dichroic circuits plate Metallized polymeric foam material M-FS-22401 B74-10225 09 NPO-13171 B74-10283 01 ARC-10860 B74-10218 04 COMPUTERIZED SIMULATION **CROSS FLOW** Liquid-cooled liner for helmets Antiskid braking system Investigation of exit-velocity stratification B74-10146 06 ARC-10534 B74-10249 05 M-FS-22807 Self-regenerating desiccant system effects on jets in a crossflow (STRJET) COMPUTERS LANGLEY-11581 B74-10207 09 B74-10266 07 M-FS-23057 Space ultrareliable modular computer **CRYOGENIC FLUIDS** (SUMC) instruction simulator COORDINATION Improved thermal isolation for B74-10145 09 fault-tolerant M-FS-22697 High-speed superconducting magnet systems telemetry/computer interface CONDENSATES NPO-11875 B74-10158 02 NPO-13139 B74-10296 02 Heat pipe with hot gas reservoir **CRYSTAL GROWTH** COPOLYMERIZATION ARC-10847 B74-10216 03 Improved epitaxial process for fabricating Polyelectrolytes with high charge CONDUCTION BANDS silicon carbide semiconductor devices density Efficiency increased in new solar cell: LEWIS-12094 B74-10017 04 NPO-11918 B74-10159 04 A Concept **CRYSTAL STRUCTURE** LANGLEY-11174 COPPER B74-10090 01 Improved epitaxial process for fabricating tungsten Casting copper to CONNECTORS silicon carbide semiconductor devices high-power arc lamp cathodes Mechanical coupling for high cyclic B74-10017 04 LFWIS-12094 LEWIS-12169 B74-10011 04 loading **CURRENT AMPLIFIERS** CORROSION LEWIS-11690 B74-10001 06 Bio-isolated DC operational amplifier Valve degradation detector Pocket gauge for checking insert clocking ARC-10596 B74-10112 01 B74-10117 03 ARC-10850 of multipin circular connectors **CURRENT DISTRIBUTION** NPO-11924 B74-10160 01 CORRUGATING Generalized current distribution rule Artificial limb connection Horn antenna with v-shaped corrugated B74-10093 02 LANGLEY-11565 KSC-10833 B74-10183 05 surface **CURRENT REGULATORS** LANGLEY-11112 B74-10260 01 CONSTRUCTION Self-healing fuse Bolt installation tool for tightening large COUNTERFLOW LEWIS-11964 B74-10004 02 nuts and bolts Methods for improved resolution of flow Radioisotope thermal generator (RTG) NPO-13059 B74-10164 07 electrophoresis cells power conditioner M-FS-22223 B74-10032 04 Expandable space frames B74-10022 03 LANGLEY-11313 B74-10252 06 ERC-10365 COUNTING **CURVE FITTING** New insulation attachment method Improved methods for counting bacteria Generalized curve fit and plotting eliminates compatibility bondline stresses (GECAP) program in physiological fluids

B74-10231 05

M-FS-22728

MSC-12615

B74-10269 07

GSEC-11917

B74-10044 09

CURVED PANELS	DEGASSING	DIELECTRICS
Computer program for buckling loads of orthotropic laminated stiffened panels	Two-phase, passive separator-and-filter assembly	High voltage solid-state relay LEWIS-12096 B74-10006 01
subjected to biaxial in-place loads	LANGLEY-10976 B74-10133 04	Volume-reflecting dielectric heat shield
(BUCLASP 2)	DENTISTRY	ARC-10803 B74-10074 04
LANGLEY-11199 B74-10203 09	New tooth enamel from brushite	DIFFUSION
Computer program for stresses and	crystals	In-process oxidation protection in fluxless
buckling of heated composite-stiffened	ERC-10338 874-10199 05	brazing or diffusion bonding of aluminum
panels and other structures (BUCLASP 3) LANGLEY-11533 B74-10204 09	DEPOSITION	alloys MSC-14435 B74-10096 04
LANGLEY-11533 B74-10204 09 CUSHIONS	Fabrication of thick structures by	DIGITAL COMPUTERS
Cushion module for stowing electronic	sputtering LEWIS-12331 B74-10126 08	Error-correcting codes for high-speed
equipment	Depositing spacing layers on magnetic	digital computers
ARC-10779 B74-10073 04	film with liquid phase epitaxy	M-FS-22887 B74-10147 02
CUTTERS	LANGLEY-11528 B74-10262 01	DIGITAL DATA
Precision glasscutter LANGLEY-11604 B74-10031 07	DESCENT	Data summary and computer program for axial-flow pump rotor performance
CUTTING	Emergency descent device	LEWIS-11920 B74-10127 09
Alinement fixture for precision cutting	M-FS-23074 B74-10226 05	Anti-multipath digital signal detector
of printed-wiring boards	DESICCATORS	LANGLEY-11379 B74-10137 02
LANGLEY-11658 B74-10290 01	Self-regenerating desiccant system M-FS-23057 B74-10266 07	DIGITAL FILTERS
CYCLIC LOADS	DESTRUCTIVE TESTS	Low-distortion receiver for bilevel,
Mechanical coupling for high cyclic loading	Economical technique for fragmentation	baseband PCM waveforms MSC-14557 B74-10025 02
LEWIS-11690 B74-10001 06	testing	DIGITAL SYSTEMS
	ARC-10792 B74-10052 04	Modular digital computer system
_	Apparatus for monitoring linear explosive	design
D	performance LANGLEY-10800 B74-10201 04	M-FS-22935 B74-10034 09
	High-temperature tensile tester for	Dynamic polarization compensating system for optical communications
DAMPING Eigenfunction solution of damped	ceramics	receiver
Eigenfunction solution of damped structural systems: DAMP	ARC-10822 B74-10244 04	GSFC-11782 B74-10182 03
NPO-13480 B74-10169 09	Detection of cracks in surface	Digital multichannel photometer
DAMPING TESTS	Detection of cracks in surface insulation	HQ-10791 B74-10200 03
Fluid dynamics test method NPO-11895 B74-10211 03	MSC-14187 B74-10095 04	Computerized logic design of digital
NPO-11895 B74-10211 03 DATA MANAGEMENT	Wavelength-selective, sequential Q-	circuits M-FS-22401 B74-10225 09
Marshall information retrieval and display	switching laser cavity	Digital second-order phase-locked loop
system (MIRADS)	LANGLEY-11045 B74-10134 03 Negative ion spectrometry for detecting	NPO-11905 B74-10274 O1
M-FS-22536 B74-10043 09	nitrated explosives	DIGITAL TECHNIQUES
Remote sunfall monitor: A concept	NPO-13082 B74-10276 02	Micrometeoroid composition analyzer
M-FS-22943 B74-10149 03	DC-to-AC inverter ratio failure detector	GSFC-11892 B74-10287 01 DIMENSIONAL MEASUREMENT
DATA PROCESSING EQUIPMENT Data processor with conditionally	NPO-13160 B74-10282 01 Micrometeoroid composition analyzer	Accurate thickness measurement of
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GSFC-11849 B74-10242 01 KSC-10850 B74-10039 07 B74-10089 01 GSFC-11627 **DOPPLER EFFECT ELASTIC SHELLS ELECTRIC SWITCHES** Traffic control system and method Computer program for structural analysis Self-healing fuse B74-10024 02 GSFC-10087 of layered orthotropic ring-stiffened shells LEWIS-11964 B74-10004 02 Digital second-order phase-locked loop of revolution (SALORS): Linear stress Self-protecting solid state isolated NPO-11905 B74-10274 01 analysis option switch **DOSIMETERS** LANGLEY-11569 B74-10186 09 LEWIS-12268 B74-10069 01 Calorimetric detection of neutral-atom **ELASTOMERS** Very high voltage latching relay content of ion beam Control of elasticity in cast elastomeric LEWIS-12265 B74-10079 01 LANGLEY-11505 B74-10184 03 shock/vibration isolators Radio-controlled, sound-operated switch DRAG MEASUREMENT KSC-10850 B74-10039 07 LANGI FY-11641 B74-10143 03 Probe for measuring turbulent real-time Flame resistant elastic elastomeric fiber **ELECTRICAL FAULTS** shear-stress waves MSC-14331 B74-10157 04 Self-protected electrodes B74-10072 03 ARC-10755 New insulation attachment method field-emission current DRUGS eliminates compatibility bondline stresses B74-10253 01 ERC-10015 Automated drug identification system MSC-12615 B74-10269 07 **ELECTRICAL GROUNDING** NPO-13063 B74-10213 05 **ELECTRIC BATTERIES** Bio-isolated DC operational amplifier Liquid sample processor Radioisotope thermal generator (RTG) ARC-10596 B74-10112 01 NPO-13136 B74-10278 05 **ELECTRICAL IMPEDANCE** power conditioner DUCTED BODIES LANGLEY-11313 B74-10022 03 Generalized current distribution rule Computer program for steamtube Battery activation system LANGLEY-11565 B74-10093 02 curvature analysis: Analytical method ARC-10832 B74-10056 03 **ELECTRICAL MEASUREMENT** LANGLEY-11535 B74-10206 09 Electrometer system measures Efficiency increased in new solar cell: **DUCTED FAN ENGINES** nanoamps at high voltage A Concept B74-10064 01 Noise suppressor B74-10090 01 LEWIS-12267 LANGLEY-11174 LANGLEY-11141 B74-10261 03 DC-to-AC inverter ratio failure detector Facility for testing solar cells **DYNAMIC CHARACTERISTICS** NPO-13160 B74-10282 01 NPO-11761 B74-10099 02 Computer program for flexible rotor **ELECTRICAL RESISTANCE** battery Lead-oxygen closed-loop dynamics analysis Three-point bridge calibration with one system LEWIS-12153 B74-10084 09 resistor M-FS-23059 B74-10267 06 Separation dynamics of S-II derivative ARC-10762 B74-10047 01 **ELECTRO-OPTICS** launch vehicle **ELECTRIC BRIDGES** M-FS-24325 B74-10151 06 Three-point bridge calibration with one System for measuring transients in fluid flow Eigenfunction solution of damped resistor structural systems: DAMP ARC-10762 B74-10047 01 ARC-10852 B74-10217 03 NPO-13480 B74-10169 09 **ELECTROCARDIOGRAPHY** ELECTRIC CHARGE **DYNAMIC RESPONSE** Heart-rate pulse-shift detector Micrometeoroid composition analyzer ARC-10729 B74-10196 01 Improved capacitance multiplier circuit GSFC-11892 B74-10287 01 NPO-11948 B74-10162 02 **ELECTROCHEMICAL CELLS ELECTRIC CONNECTORS** DYNAMIC STABILITY Carbon monoxide detector Improved circuit-board interconnectors Implementation of a self-controlling M-FS-23090 B74-10268 04 MSC-12661 B74-10239 01 heater: A concept **ELECTRODEPOSITION ELECTRIC CONTROL** B74-10241 06 GSFC-11752 High strength. wire-reinforced Electrostatically controlled heat shutter DYNAMIC STRUCTURAL ANALYSIS electroformed structures NPO-11942 B74-10161 03 LEWIS-12087 B74-10018 08 Dynamic transformation method M-FS-22848 B74-10076 06 **ELECTRIC CURRENT ELECTRODES** Finger recording electrode system for Electrometer Model optimization using statistical system measures estimation nanoamps at high voltage electrical impedance plethysmograph M-FS-22873 B74-10189 09 LEWIS-12267 B74-10064 01 ARC-10816 B74-10172 05

ELECTROFORMING SUBJECT INDEX

ELECTROFORMING High strength, wire-reinforced	Improved circuit-board interconnectors MSC-12661 B74-10239 01	Control vane for engine exhaust flow LANGLEY-11570 B74-10138 06
electroformed structures	Low-temperture electrostatic	ENGINE PARTS
LEWIS-12087 B74-10018 08	silicon-to-silicon seals using sputtered	A new nickel-base wrought superalloy
ELECTROLYTES	borosilicate glass	for applications up to 1033 K (1400 F)
Battery activation system	LANGLEY-11589 B74-10263 08	LEWIS-11827 B74-10002 04
ARC-10832 B74-10056 03	ELECTRONIC TRANSDUCERS	Design criteria monograph on turbopump
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NPO-11918 B74-10159 04	LEWIS-12094 B74-10017 04	Design criteria monograph for actuators
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Improved fabrication of electrolytic	Methods for improved resolution of flow	LEWIS-12264 B74-10061 06
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M-FS-23133 B74-10294 01 ELECTROMAGNETIC RADIATION	M-FS-22223 B74-10032 04	properties up to 1478 K (2200 F)
Pocket-size microwave radiation hazard	ELECTROPLATING	LEWIS-12089 B74-10081 03
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NPO-11461 B74-10097 02	an effective solar collector coating	for applications up to 2200 F
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GSFC-11079 B74-10254 03	electrical impedance plethysmograph	ARC-10797 B74-10053 04
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trode guidance system	to-silicon seals using sputtered borosilicate	
M-FS-23026 B74-10150 02	glass	Enzymatic regeneration of adenosine
LECTRON BOMBARDMENT	LANGLEY-11589 B74-10263 08	triphosphate cofactor
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LANGLEY-11505 B74-10184 03	ARC-10842 B74-10115 02	Improved epitaxial process for fabricating
LECTRON CAPTURE	EMBRITTLEMENT	silicon carbide semiconductor devices
Negative ion spectrometry for detecting	Evaluation of test procedures for	LEWIS-12094 B74-10017 04
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NPO-13082 B74-10276 02	ARC-10919 B74-10222 04	film with liquid phase epitaxy
LECTRON EMISSION	EMERGENCY LIFE SUSTAINING	LANGLEY-11528 B74-10262 01
Integrated structure vacuum tube: A	SYSTEMS	EPOXY RESINS
Concept	Emergency descent device	Pressure application technique for
ARC-10445 B74-10110 01	M-FS-23074 B74-10226 05	high-temperature composite fabrication
Improved channel multiplier for	ENAMELS	LANGLEY-11601 B74-10141 08
radiation-and-particle detectors	New tooth enamel from brushite	
NPO-12128 B74-10275 03	crystals	Inexpensive lightweight mirror MSC-14615 B74-10155 05
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Low cost instrumentation amplifier	Commercially available black chrome is	ERROR CORRECTING DEVICES
LEWIS-12222 B74-10015 01	an effective solar collector coating	Error-correcting codes for high-speed
Cushion module for stowing electronic	LEWIS-12159 B74-10121 04	digital computers
equipment	ENERGY CONVERSION	M-FS-22887 B74-10147 02
ARC-10779 B74-10073 04	Mechanical solar motor: A concept	ERRORS
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electromechanical components: A report	ENERGY STORAGE	measurement of frequency
NPO-13153 B74-10280 01	Solar array deployment from a spinning	MSC-14649 B74-10191 02
Improved fabrication of electrolytic	spacecraft	ESCAPE SYSTEMS
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M-FS-23133 B74-10294 01	Radioisotope heater	M-FS-23074 B74-10226 05
LECTRONIC MODULES	ARC-10791 B74-10051 03	ETCHING
Advanced-priority interrupt module	Battery activation system	Process to restore obliterated serial
NPO-13067 B74-10165 02	ARC-10832 B74-10056 03	numbers on metal surfaces
Depositing spacing layers on magnetic	Efficiency increased in new solar cell:	LEWIS-12085 B74-10020 07
. 0, 0,	A Concept	A method for polycrystalline silicon
film with liquid phase epitaxy LANGLEY-11528 B74-10262 01	LANGLEY-11174 B74-10090 01	delineation applicable to a double-diffused
	Facility for testing solar cells	MOS transistor
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ARC-10828 B74-10055 03	Design criteria monograph for pressure	EUTECTIC ALLOYS
Cushion module for stowing electronic	regulators, relief valves, check valves, burst	Binary alloys for refractory-metal
equipment	disks, and explosive valves	brazing
ARC-10779 B74-10073 04	221110 12100	LEWIS-12184 B74-10125 08
Microelectronics packaging technique: A	Design criteria monograph on turbopump	EVACUATING (TRANSPORTATION)
Concept P74 10102 01	shafts and couplings	Emergency descent device
MSC-19399 B74-10192 01	LEWIS-12204 B74-10014 07	M-FS-23074 B74-10226 05

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EVALUATION	Depositing spacing layers on magnetic	FILM THICKNESS
Space ultrareliable modular computer	film with liquid phase epitaxy	Method of measuring the thickness of
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Remote sunfall monitor: A concept	concept for composite materials	A high yield neutron target
M-FS-22943 B74-10149 03	LANGLEY-11628 B74-10264 04	LEWIS-12058 B74-10066 03
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system (FACES) M-FS-22910 B74-10190 09	capacitors M-FS-23133 B74-10294 01	Two-phase, passive separator-and-filter
Apparatus for monitoring linear explosive		assembly LANGLEY-10976 B74-10133 04
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LANGLEY-10800 B74-10201 04	LEWIS-12238 B74-10078 02	LANGLEY-11606 B74-10177 04
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ARC-10919 B74-10222 04	MSC-19335 B74-10023 07	LANGLEY-11579 B74-10140 05
Horn antenna with v-shaped corrugated surface	New insulation attachment method	Finger recording electrode system for
LANGLEY-11112 B74-10260 01	eliminates compatibility bondline stresses MSC-12615 B74-10269 07	electrical impedance plethysmograph ARC-10816 B74-10172 05
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NPO-13143 B74-10279 09	ARC-10534 B74-10249 05	velocities and streamlines on mid-channel flow surface of axial or mixed-flow
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ARC-10847 B74-10216 03	by a compressive stress (HYSTERESIS)	LEWIS-12129 B74-10130 09
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EXHAUST NOZZLES	M-FS-22807 B74-10146 06	Fail-safe fire detection system
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aircraft	power source: A concept	FIRE FIGHTING Emergency descent device
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devices	system	Combustion products generating and metering device
NPO-11743 B74-10194 03	M-FS-23059 B74-10267 06	GSFC-11095 B74-10036 04
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aluminum and steel tubes	LEWIS-12218 B74-10068 01	aluminum phosphate fibers LANGLEY-11526 B74-10185 08
MSC-14721 B74-10272 08	Laser-actuated mechanical device	FITTINGS
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Apparatus for monitoring linear explosive performance	Laser system to detonate explosive devices	KSC-10833 B74-10183 05 FLAME IONIZATION
LANGLEY-10800 B74-10201 04	NPO-11743 B74-10194 03	Modulated hydrogen-ion flame detector:
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Liquid sample processor	Polymer compositions suitable for use	hot gases and flames
NPO-13136 B74-10278 05	in enriched oxygen atmospheres	LEWIS-12055 B74-10060 03
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NPO-13157 B74-10281 01	Flame resistant elastic elastomeric fiber MSC-14331 B74-10157 04	LANGLEY-11443 B74-10030 06
	Process for fabrication of stabilized	Design standards for low-profile flanges
F	aluminum phosphate fibers	M-FS-22708 B74-10033 09
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sandwich structures XLA-11028

B74-10192 01

Concept MSC-19399

B74-10125 08

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LANGLEY-11199 B74-10203 09	NPO-11775 B74-10100 01	LEWIS-11910 B74-10128 09
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LANGLEY-11699 B74-10291 03	FLUORIDES	flow surface of axial or mixed-flow
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Mechanical coupling for high cyclic	coatings for lubrication to 1170 K (1650	LEWIS-12129 B74-10130 09
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LEWIS-11690 B74-10001 06	LEWIS-11930 B74-10016 04	(SUMC) instruction simulator
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	Pressure application technique for	subjected to biaxial in-place loads
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FLOTATION	Design standards for low-profile flanges	and vibration of complex branched shells
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FLUID DYNAMICS Fluid dynamics test method NPO-11895 B74-10211 03	Computation of aerodynamic interference	
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FLUID DYNAMICS Fluid dynamics test method NPO-11895 B74-10211 03 FLUID FILTERS Full-flow fluid filter	between lifting surfaces and lift- and cruise-fans	hydrogen environment embrittlement ARC-10919 B74-10222 04
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High-efficiency multifrequency feed	A concept ARC-10322 B74-10071 03	low-density ablative compositions
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circuit using frequency multiplication ERC-10285 B74-10251 01	Shutoff and throttling valve	GSFC-10087 874-10024 02
FREQUENCY SYNTHESIZERS	NPO-11951 B74-10105 07	GUNS Economical technique for fragmentation
Minicomputer-controlled frequency	Control vane for engine exhaust flow	testing
generator NPO-11962 B74-10163 02	LANGLEY-11570 B74-10138 06 GAS GENERATORS	ARC-10792 B74-10052 04
FRESNEL DIFFRACTION	Design criteria monograph for liquid	GUNS (ORDNANCE) Cobalt base superalloy has outstanding
A low cost "Air Mass 2" solar	propellant gas generators	properties up to 1478 K (2200 F)
simulator	LEWIS-12139 B74-10008 07 GAS IONIZATION	LEWIS-12089 B74-10081 03
LEWIS-12266 B74-10086 02 FRICTION REDUCTION	Modulated hydrogen-ion flame detector:	GYROSCOPES
Lightweight, high speed bearing balls:	A concept	Temperature compensation of digital inertial sensors
A concept	ARC-10322 B74-10071 03 Electrostatically controlled heat shutter	NPO-13044 B74-10106 02
LEWIS-11087 B74-10013 06	NPO-11942 B74-10161 03	
Plasma-sprayed metal-glass fluoride coatings for lubrication to 1170 K (1650	GAS PRESSURE	
F) .	Remotely operated gas-pressure	н
LEWIS-11930 B74-10016 04	regulator and shuttle valve	
FUEL FLOW		HANDBOOKS Design criteria monograph for valve
FUEL FLOW Propellant acquisition device for use with a spinning toroidal tank	NPO-13201 B74-10298 07 GAS SPECTROSCOPY Improved nondispersive infrared	Design criteria monograph for valve components
FUEL FLOW Propellant acquisition device for use with a spinning toroidal tank ARC-10840 B74-10059 06	NPO-13201 B74-10298 07 GAS SPECTROSCOPY Improved nondispersive infrared analyzer	Design criteria monograph for valve components LEWIS-12327 B74-10087 06
FUEL FLOW Propellant acquisition device for use with a spinning toroidal tank ARC-10840 B74-10059 06 FUEL VALVES	NPO-13201 B74-10298 07 GAS SPECTROSCOPY Improved nondispersive infrared analyzer	Design criteria monograph for valve components LEWIS-12327 B74-10087 06 Guidebook of nondestructive evaluation
FUEL FLOW Propellant acquisition device for use with a spinning toroidal tank ARC-10840 B74-10059 06	NPO-13201 B74-10298 07 GAS SPECTROSCOPY Improved nondispersive infrared analyzer ARC-10802 B74-10243 03 GAS TURBINE ENGINES New nickel-base wrought superalloy with	Design criteria monograph for valve components LEWIS-12327 B74-10087 06
FUEL FLOW Propellant acquisition device for use with a spinning toroidal tank ARC-10840 B74-10059 06 FUEL VALVES Design criteria monograph for pressure regulators, relief valves, check valves, burst disks, and explosive valves	NPO-13201 B74-10298 07 GAS SPECTROSCOPY Improved nondispersive infrared analyzer ARC-10802 B74-10243 03 GAS TURBINE ENGINES New nickel-base wrought superalloy with applications up to 1253 K (1800 F)	Design criteria monograph for valve components LEWIS-12327 B74-10087 06 Guidebook of nondestructive evaluation techniques for materials and structures
FUEL FLOW Propellant acquisition device for use with a spinning toroidal tank ARC-10840 B74-10059 06 FUEL VALVES Design criteria monograph for pressure regulators, relief valves, check valves, burst disks, and explosive valves LEWIS-12168 B74-10010 07	NPO-13201 B74-10298 07 GAS SPECTROSCOPY Improved nondispersive infrared analyzer ARC-10802 B74-10243 03 GAS TURBINE ENGINES New nickel-base wrought superalloy with	Design criteria monograph for valve components LEWIS-12327 B74-10087 06 Guidebook of nondestructive evaluation techniques for materials and structures LEWIS-12272 B74-10122 04 Telecommunications systems design techniques handbook
FUEL FLOW Propellant acquisition device for use with a spinning toroidal tank ARC-10840 B74-10059 06 FUEL VALVES Design criteria monograph for pressure regulators, relief valves, check valves, burst disks, and explosive valves	NPO-13201 B74-10298 07 GAS SPECTROSCOPY Improved nondispersive infrared analyzer ARC-10802 B74-10243 03 GAS TURBINE ENGINES New nickel-base wrought superalloy with applications up to 1253 K (1800 F) LEWIS-11828 B74-10003 04 High strength nickel base alloy, WAZ-16, for applications up to 2200 F	Design criteria monograph for valve components LEWIS-12327 B74-10087 06 Guidebook of nondestructive evaluation techniques for materials and structures LEWIS-12272 B74-10122 04 Telecommunications systems design techniques handbook NPO-13245 B74-10284 02
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FUEL FLOW Propellant acquisition device for use with a spinning toroidal tank ARC-10840 B74-10059 06 FUEL VALVES Design criteria monograph for pressure regulators, relief valves, check valves, burst disks, and explosive valves LEWIS-12168 B74-10010 07 Design criteria monograph for valve components LEWIS-12327 B74-10087 06 FUNCTION GENERATORS	NPO-13201 B74-10298 07 GAS SPECTROSCOPY Improved nondispersive infrared analyzer ARC-10802 B74-10243 03 GAS TURBINE ENGINES New nickel-base wrought superalloy with applications up to 1253 K (1800 F) LEWIS-11828 B74-10003 04 High strength nickel base alloy, WAZ-16, for applications up to 2200 F	Design criteria monograph for valve components LEWIS-12327 B74-10087 06 Guidebook of nondestructive evaluation techniques for materials and structures LEWIS-12272 B74-10122 04 Telecommunications systems design techniques handbook NPO-13245 B74-10284 02 HANDLES A band clamp with a spring toggle lever
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FUEL FLOW Propellant acquisition device for use with a spinning toroidal tank ARC-10840 B74-10059 06 FUEL VALVES Design criteria monograph for pressure regulators, relief valves, check valves, burst disks, and explosive valves LEWIS-12168 B74-10010 07 Design criteria monograph for valve components LEWIS-12327 B74-10087 06 FUNCTION GENERATORS Logarithmic-function generator ERC-10267 B74-10285 02 FUNGICIDES	NPO-13201 B74-10298 07 GAS SPECTROSCOPY Improved nondispersive infrared analyzer ARC-10802 B74-10243 03 GAS TURBINE ENGINES New nickel-base wrought superalloy with applications up to 1253 K (1800 F) LEWIS-11828 B74-10003 04 High strength nickel base alloy, WAZ-16, for applications up to 2200 F LEWIS-12270 B74-10082 04 GAS TURBINES Design criteria monograph for liquid propellant gas generators LEWIS-12139 B74-10008 07	Design criteria monograph for valve components LEWIS-12327 B74-10087 06 Guidebook of nondestructive evaluation techniques for materials and structures LEWIS-12272 B74-10122 04 Telecommunications systems design techniques handbook NPO-13245 B74-10284 02 HANDLES A band clamp with a spring toggle lever MSC-14736 B74-10240 07 HARDENING (MATERIALS)
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FUEL FLOW Propellant acquisition device for use with a spinning toroidal tank ARC-10840 B74-10059 06 FUEL VALVES Design criteria monograph for pressure regulators, relief valves, check valves, burst disks, and explosive valves LEWIS-12168 B74-10010 07 Design criteria monograph for valve components LEWIS-12327 B74-10087 06 FUNCTION GENERATORS Logarithmic-function generator ERC-10267 B74-10285 02 FUNGICIDES Polyelectrolytes with high charge density NPO-11918 B74-10159 04 FURNACES High strength nickel base alloy, WAZ-16, for applications up to 2200 F LEWIS-12270 B74-10082 04 FUSES Self-healing fuse	RPO-13201 B74-10298 07 GAS SPECTROSCOPY Improved nondispersive infrared analyzer ARC-10802 B74-10243 03 GAS TURBINE ENGINES New nickel-base wrought superalloy with applications up to 1253 K (1800 F) LEWIS-11828 B74-10003 04 High strength nickel base alloy, WAZ-16, for applications up to 2200 F LEWIS-12270 B74-10082 04 GAS TURBINES Design criteria monograph for liquid propellant gas generators LEWIS-12139 B74-10008 07 Advanced tungsten fiber-reinforced nickel superalloy LEWIS-12394 B74-10248 04 GASKETS Soft, thermally conductive material LANGLEY-10850 B74-10132 04 GATES (CIRCUITS) High voltage solid-state relay LEWIS-12096 B74-10006 01 GE COMPUTERS Computer program for spacecraft-booster separation spring selection, set composition, and location determination	Design criteria monograph for valve components LEWIS-12327 B74-10087 06 Guidebook of nondestructive evaluation techniques for materials and structures LEWIS-12272 B74-10122 04 Telecommunications systems design techniques handbook NPO-13245 B74-10284 02 HANDLES A band clamp with a spring toggle lever MSC-14736 B74-10240 07 HARDENING (MATERIALS) Lightweight, high speed bearing balls: A concept LEWIS-11087 B74-10013 06 HEART RATE Heart-rate pulse-shift detector ARC-10729 B74-10196 01 HEAT Radioisotope thermal generator (RTG) power conditioner LANGLEY-11313 B74-10022 03 HEAT MEASUREMENT Calorimetric detection of neutral-atom content of ion beam
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A new nickel-base wrought superalloy	Reversed cowl-flap thrust augmentor	LIGHT ADAPTATION
for applications up to 1033 K (1400 F)	ARC-10754 B74-10046 06	Color-coded area sensitivity maps of
LEWIS-11827 B74-10002 04	LANDSAT SATELLITES	photomultipliers
Reversed cowl-flap thrust augmentor	Computer program for spacecraft-booster	LANGLEY-10320 B74-10259 01
ARC-10754 B74-10046 06	separation spring selection, set	LIGHT AIRCRAFT
Rotating turbine blade pyrometer	composition, and location determination	Pulse-width-modulated servo valve for
LEWIS-12218 B74-10068 01 Cobalt base superalloy has outstanding	GSFC-11616 874-10037 09	autopilot system LANGLEY-11643 B74-10179 06
properties up to 1478 K (2200 F)	LANDSAT 1	LIGHT MODULATION
LEWIS-12089 B74-10081 03	Vertical copy camera system provides photographs from erts-1 imagery	Improved nondispersive infrared
High strength nickel base alloy, WAZ-16,	LEWIS-12140 B74-10009 07	analyzer
for applications up to 2200 F	LARGE SCALE INTEGRATION	ARC-10802 B74-10243 03
LEWIS-12270 B74-10082 04	Data processor with conditionally	Optical communication channel simulator
JET EXHAUST	supplied clock signals	system
Investigation of exit-velocity stratification effects on jets in a crossflow (STRJET)	GSFC-10975 B74-10021 02	GSFC-11877 B74-10258 01 LIGHTING EQUIPMENT
LANGLEY-11581 B74-10207 09	LASER MODES	Casting copper to tungsten for
JET FLOW	Dually-mode-locked ND: YAG laser	high-power arc lamp cathodes
Reversed cowl-flap thrust augmentor	GSFC-11746 B74-10038 03	LEWIS-12169 B74-10011 04
ARC-10754 B74-10046 06	LASER OUTPUTS Recorder/processor apparatus	LIMITER CIRCUITS
Thrust vector control for V/STOL	GSFC-11553 B74-10042 03	Self-healing fuse
aircraft ARC-10788 B74-10049 06	Wavelength-selective, sequential Q-	LEWIS-11964 B74-10004 02 LINEARITY
JET VANES	switching laser cavity	Wide deviation phase modulator
Vented vectoring-nozzle for STOL and	LANGLEY-11045 B74-10134 03	LANGLEY-11607 B74-10178 02
V/STOL aircraft	LASERS	LININGS
ARC-10839 B74-10058 06	Surface roughness measured by optical	Liquid-cooled liner for helmets
JIGS	signatures	ARC-10534 B74-10249 05
Flange design for large-scale modular	ARC-10853 B74-10118 03 LATERAL STABILITY	LIQUID COOLING
assembly jigs	In vivo measurement of mechanical	Liquid-cooled liner for helmets ARC-10534 B74-10249 05
MSC-19372 B74-10273 06	impedance of bone	LIQUID FLOW
JOINTS (JUNCTIONS) Automatic soldering machine	ARC-10857 B74-10245 05	Shutoff and throttling valve
MSC-19401 B74-10193 06	LAUNCH VEHICLES	NPO-11951 B74-10105 07
Explosive welding technique for joining	Separation dynamics of S-II derivative	LIQUID PHASES
aluminum and steel tubes	launch vehicle	Depositing spacing layers on magnetic
MSC-14721 B74-10272 08	M-FS-24325 B74-10151 06	film with liquid phase epitaxy LANGLEY-11528 B74-10262 01
	Lead-oxygen closed-loop battery	LIQUID PROPELLANT ROCKET
•	, ,	ENGINES
	system	ENGINES
K	system M-FS-23059 B74-10267 06	Design criteria monograph on turbopump
К		Design criteria monograph on turbopump shafts and couplings
KJELDAHL METHOD	M-FS-23059 B74-10267 06 LEAKAGE Improved circumferential shaft seal	Design criteria monograph on turbopump shafts and couplings LEWIS-12204 B74-10014 07
KJELDAHL METHOD Rapid method for determining nitrogen	M-FS-23059 B74-10267 06 LEAKAGE Improved circumferential shaft seal LEWIS-11873 B74-10062 07	Design criteria monograph on turbopump shafts and couplings LEWIS-12204 B74-10014 07 Propellant acquisition device for use with
. KJELDAHL METHOD Rapid method for determining nitrogen in tantalum and niobium alloys	M-FS-23059 B74-10267 06 LEAKAGE Improved circumferential shaft seal LEWIS-11873 B74-10062 07 Electrometer system measures	Design criteria monograph on turbopump shafts and couplings LEWIS-12204 B74-10014 07
KJELDAHL METHOD Rapid method for determining nitrogen	M-FS-23059 B74-10267 06 LEAKAGE Improved circumferential shaft seal LEWIS-11873 B74-10062 07 Electrometer system measures nanoamps at high voltage	Design criteria monograph on turbopump shafts and couplings LEWIS-12204 B74-10014 07 Propellant acquisition device for use with a spinning toroidal tank
. KJELDAHL METHOD Rapid method for determining nitrogen in tantalum and niobium alloys	M-FS-23059 B74-10267 06 LEAKAGE Improved circumferential shaft seal LEWIS-11873 B74-10062 07 Electrometer system measures nanoamps at high voltage LEWIS-12267 B74-10064 01	Design criteria monograph on turbopump shafts and couplings LEWIS-12204 B74-10014 07 Propellant acquisition device for use with a spinning toroidal tank ARC-10840 B74-10059 06 Design criteria monograph for valve components
KJELDAHL METHOD Rapid method for determining nitrogen in tantalum and niobium alloys LEWIS-12237 B74-10085 04	M-FS-23059 B74-10267 06 LEAKAGE Improved circumferential shaft seal LEWIS-11873 B74-10062 07 Electrometer system measures nanoamps at high voltage LEWIS-12267 B74-10064 01 LENSES	Design criteria monograph on turbopump shafts and couplings LEWIS-12204 B74-10014 07 Propellant acquisition device for use with a spinning toroidal tank ARC-10840 B74-10059 06 Design criteria monograph for valve components LEWIS-12327 B74-10087 06
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Rapid method for determining nitrogen in tantalum and niobium alloys LEWIS-12237 B74-10085 04	M-FS-23059 B74-10267 06 LEAKAGE Improved circumferential shaft seal LEWIS-11873 B74-10062 07 Electrometer system measures nanoamps at high voltage LEWIS-12267 B74-10064 01 LENSES Acoustic-optic deflector telescope	Design criteria monograph on turbopump shafts and couplings LEWIS-12204 B74-10014 07 Propellant acquisition device for use with a spinning toroidal tank ARC-10840 B74-10059 06 Design criteria monograph for valve components LEWIS-12327 B74-10087 06 Design criteria monograph for valve assemblies
KJELDAHL METHOD Rapid method for determining nitrogen in tantalum and niobium alloys LEWIS-12237 B74-10085 04 L LABORATORY EQUIPMENT	M-FS-23059 Color	Design criteria monograph on turbopump shafts and couplings LEWIS-12204 B74-10014 07 Propellant acquisition device for use with a spinning toroidal tank ARC-10840 B74-10059 06 Design criteria monograph for valve components LEWIS-12327 B74-10087 06 Design criteria monograph for valve assemblies LEWIS-12332 B74-10227 06
Rapid method for determining nitrogen in tantalum and niobium alloys LEWIS-12237 B74-10085 04	M-FS-23059 Color	Design criteria monograph on turbopump shafts and couplings LEWIS-12204 B74-10014 07 Propellant acquisition device for use with a spinning toroidal tank ARC-10840 B74-10059 06 Design criteria monograph for valve components LEWIS-12327 B74-10087 06 Design criteria monograph for valve assemblies LEWIS-12332 B74-10227 06 Design criteria monograph on centrifugal
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Rapid method for determining nitrogen in tantalum and niobium alloys LEWIS-12237 B74-10085 04 L LABORATORY EQUIPMENT Automated single-slide staining system LANGLEY-11649 B74-10188 05	M-FS-23059 B74-10267 06 LEAKAGE Improved circumferential shaft seal LEWIS-11873 B74-10062 07 Electrometer system measures nanoamps at high voltage LEWIS-12267 B74-10064 01 LENSES Acoustic-optic deflector telescope M-FS-23107 B74-10293 03 LEVEL (HORIZONTAL) Self-leveling load table M-FS-22039 B74-10144 06 LIFE SUPPORT SYSTEMS Programmed-pressure air supply for	Design criteria monograph on turbopump shafts and couplings LEWIS-12204 B74-10014 07 Propellant acquisition device for use with a spinning toroidal tank ARC-10840 B74-10059 06 Design criteria monograph for valve components LEWIS-12327 B74-10087 06 Design criteria monograph for valve assemblies LEWIS-12332 B74-10227 06 Design criteria monograph on centrifugal flow turbopumps
Rapid method for determining nitrogen in tantalum and niobium alloys LEWIS-12237 B74-10085 04 L LABORATORY EQUIPMENT Automated single-slide staining system LANGLEY-11649 B74-10188 05 Liquid sample processor	M-FS-23059 B74-10267 06 LEAKAGE Improved circumferential shaft seal LEWIS-11873 Electrometer system measures nanoamps at high voltage LEWIS-12267 B74-10064 01 LENSES Acoustic-optic deflector telescope M-FS-23107 B74-10293 03 LEVEL (HORIZONTAL) Self-leveling load table M-FS-22039 B74-10144 06 LIFE SUPPORT SYSTEMS Programmed-pressure air supply for positive-pressure breathing system	Design criteria monograph on turbopump shafts and couplings LEWIS-12204 B74-10014 07 Propellant acquisition device for use with a spinning toroidal tank ARC-10840 B74-10059 06 Design criteria monograph for valve components LEWIS-12327 B74-10087 06 Design criteria monograph for valve assemblies LEWIS-12332 B74-10227 06 Design criteria monograph on centrifugal flow turbopumps LEWIS-12346 B74-10228 06 LIQUID ROCKET PROPELLANTS Design criteria monograph for liquid
KJELDAHL METHOD Rapid method for determining nitrogen in tantalum and niobium alloys LEWIS-12237 B74-10085 04 L LABORATORY EQUIPMENT Automated single-slide staining system LANGLEY-11649 B74-10188 05 Liquid sample processor NPO-13136 B74-10278 05 LAMINAR BOUNDARY LAYER Computer program for calculating	M-FS-23059 B74-10267 06	Design criteria monograph on turbopump shafts and couplings LEWIS-12204 B74-10014 07 Propellant acquisition device for use with a spinning toroidal tank ARC-10840 B74-10059 06 Design criteria monograph for valve components LEWIS-12327 B74-10087 06 Design criteria monograph for valve assemblies LEWIS-12332 B74-10227 06 Design criteria monograph on centrifugal flow turbopumps LEWIS-12346 B74-10228 06 LIQUID ROCKET PROPELLANTS Design criteria monograph for liquid propellant gas generators
KJELDAHL METHOD Rapid method for determining nitrogen in tantalum and niobium alloys LEWIS-12237 B74-10085 04 L LABORATORY EQUIPMENT Automated single-slide staining system LANGLEY-11649 B74-10188 05 Liquid sample processor NPO-13136 B74-10278 05 LAMINAR BOUNDARY LAYER Computer program for calculating laminar, transitional, and turbulent boundary	M-FS-23059 B74-10267 06 LEAKAGE Improved circumferential shaft seal LEWIS-11873 Electrometer system measures nanoamps at high voltage LEWIS-12267 B74-10064 01 LENSES Acoustic-optic deflector telescope M-FS-23107 B74-10293 03 LEVEL (HORIZONTAL) Self-leveling load table M-FS-22039 B74-10144 06 LIFE SUPPORT SYSTEMS Programmed-pressure air supply for positive-pressure breathing system	Design criteria monograph on turbopump shafts and couplings LEWIS-12204 B74-10014 07 Propellant acquisition device for use with a spinning toroidal tank ARC-10840 B74-10059 06 Design criteria monograph for valve components LEWIS-12327 B74-10087 06 Design criteria monograph for valve assemblies LEWIS-12332 B74-10227 06 Design criteria monograph on centrifugal flow turbopumps LEWIS-12346 B74-10228 06 LIQUID ROCKET PROPELLANTS Design criteria monograph for liquid propellant gas generators LEWIS-12139 B74-10008 07
Rapid method for determining nitrogen in tantalum and niobium alloys LEWIS-12237 B74-10085 04 L LABORATORY EQUIPMENT Automated single-slide staining system LANGLEY-11649 B74-10188 05 Liquid sample processor NPO-13136 B74-10278 05 LAMINAR BOUNDARY LAYER Computer program for calculating laminar, transitional, and turbulent boundary layers for a compressible axisymmetric	M-FS-23059 B74-10267 06 LEAKAGE Improved circumferential shaft seal LEWIS-11873 B74-10062 07 Electrometer system measures nanoamps at high voltage LEWIS-12267 B74-10064 01 LENSES Acoustic-optic deflector telescope M-FS-23107 B74-10293 03 LEVEL (HORIZONTAL) Self-leveling load table M-FS-22039 B74-10144 06 LIFE SUPPORT SYSTEMS Programmed-pressure air supply for positive-pressure breathing system ARC-10845 B74-10075 05 Spacecraft oxygen recovery system	Design criteria monograph on turbopump shafts and couplings LEWIS-12204 B74-10014 07 Propellant acquisition device for use with a spinning toroidal tank ARC-10840 B74-10059 06 Design criteria monograph for valve components LEWIS-12327 B74-10087 06 Design criteria monograph for valve assemblies LEWIS-12332 B74-10227 06 Design criteria monograph on centrifugal flow turbopumps LEWIS-12346 B74-10228 06 LIQUID ROCKET PROPELLANTS Design criteria monograph for liquid propellant gas generators LEWIS-12139 B74-10008 07 Fluid dynamics test method
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Rapid method for determining nitrogen in tantalum and niobium alloys LEWIS-12237 B74-10085 04 L LABORATORY EQUIPMENT Automated single-slide staining system LANGLEY-11649 B74-10188 05 Liquid sample processor NPO-13136 B74-10278 05 LAMINAR BOUNDARY LAYER Computer program for calculating laminar, transitional, and turbulent boundary layers for a compressible axisymmetric flow LEWIS-12178 B74-10129 09	M-FS-23059 B74-10267 06 LEAKAGE Improved circumferential shaft seal LEWIS-11873 B74-10062 07 Electrometer system measures nanoamps at high voltage LEWIS-12267 B74-10064 01 LENSES Acoustic-optic deflector telescope M-FS-23107 B74-10293 03 LEVEL (HORIZONTAL) Self-leveling load table M-FS-22039 B74-10144 06 LIFE SUPPORT SYSTEMS Programmed-pressure air supply for positive-pressure breathing system ARC-10845 B74-10075 05 Spacecraft oxygen recovery system ARC-10868 B74-10220 05 LIFT FANS Computation of aerodynamic interference between lifting surfaces and lift- and	Design criteria monograph on turbopump shafts and couplings LEWIS-12204 B74-10014 07 Propellant acquisition device for use with a spinning toroidal tank ARC-10840 B74-10059 06 Design criteria monograph for valve components LEWIS-12327 B74-10087 06 Design criteria monograph for valve assemblies LEWIS-12332 B74-10227 06 Design criteria monograph on centrifugal flow turbopumps LEWIS-12346 B74-10228 06 LIQUID ROCKET PROPELLANTS Design criteria monograph for liquid propellant gas generators LEWIS-12139 B74-10008 07 Fluid dynamics test method NPO-11895 B74-10211 03
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KJELDAHL METHOD Rapid method for determining nitrogen in tantalum and niobium alloys LEWIS-12237 B74-10085 04 LABORATORY EQUIPMENT Automated single-slide staining system LANGLEY-11649 B74-10188 05 Liquid sample processor NPO-13136 B74-10278 05 LAMINAR BOUNDARY LAYER Computer program for calculating laminar, transitional, and turbulent boundary layers for a compressible axisymmetric flow LEWIS-12178 B74-10129 09 LAMINATES Computer program for buckling loads of orthotropic laminated stiffened panels subjected to biaxial in-place loads (BUCLASP 2) LANGLEY-11199 B74-10203 09	LEAKAGE Improved circumferential shaft seal LEWIS-11873 Electrometer system measures nanoamps at high voltage LEWIS-12267 B74-10064 01 LENSES Acoustic-optic deflector telescope M-FS-23107 B74-10293 03 LEVEL (HORIZONTAL) Self-leveling load table M-FS-22039 B74-10144 06 LIFE SUPPORT SYSTEMS Programmed-pressure air supply for positive-pressure breathing system ARC-10845 B74-10075 05 Spacecraft oxygen recovery system ARC-10868 B74-10220 05 LIFT FANS Computation of aerodynamic interference between lifting surfaces and lift- and cruise-fans ARC-10833 B74-10113 09 LIFTING BODIES Prediction of unsteady aerodynamic loadings caused by trailing-edge control-surface motions in subsonic	Design criteria monograph on turbopump shafts and couplings LEWIS-12204 B74-10014 07 Propellant acquisition device for use with a spinning toroidal tank ARC-10840 B74-10059 06 Design criteria monograph for valve components LEWIS-12327 B74-10087 06 Design criteria monograph for valve assemblies LEWIS-12332 B74-10227 06 Design criteria monograph on centrifugal flow turbopumps LEWIS-12346 B74-10228 06 LIQUID ROCKET PROPELLANTS Design criteria monograph for liquid propellant gas generators LEWIS-12139 B74-10008 07 Fluid dynamics test method NPO-11895 B74-10211 03 LIQUID-GAS MIXTURES Two-phase, passive separator-and-filter assembly LANGLEY-10976 B74-10133 04 LOADS (FORCES) Prediction of unsteady aerodynamic loadings caused by trailing-edge
Rapid method for determining nitrogen in tantalum and niobium alloys LEWIS-12237 B74-10085 04 L L LABORATORY EQUIPMENT Automated single-slide staining system LANGLEY-11649 B74-10188 05 Liquid sample processor NPO-13136 B74-10278 05 LAMINAR BOUNDARY LAYER Computer program for calculating laminar, transitional, and turbulent boundary layers for a compressible axisymmetric flow LEWIS-12178 B74-10129 09 LAMINATES Computer program for buckling loads of orthotropic laminated stiffened panels subjected to biaxial in-place loads (BUCLASP 2) LANGLEY-11199 B74-10203 09 Laminating cored, stressed-face,	LEAKAGE Improved circumferential shaft seal LEWIS-11873 Electrometer system measures nanoamps at high voltage LEWIS-12267 B74-10064 01 LENSES Acoustic-optic deflector telescope M-FS-23107 B74-10293 03 LEVEL (HORIZONTAL) Self-leveling load table M-FS-22039 B74-10144 06 LIFE SUPPORT SYSTEMS Programmed-pressure air supply for positive-pressure breathing system ARC-10845 B74-10075 05 Spacecraft oxygen recovery system ARC-10868 B74-10220 05 LIFT FANS Computation of aerodynamic interference between lifting surfaces and lift- and cruise-fans ARC-10833 B74-10113 09 LIFTING BODIES Prediction of unsteady aerodynamic loadings caused by trailing-edge control-surface motions in subsonic compressible flow	Design criteria monograph on turbopump shafts and couplings LEWIS-12204 B74-10014 07 Propellant acquisition device for use with a spinning toroidal tank ARC-10840 B74-10059 06 Design criteria monograph for valve components LEWIS-12327 B74-10087 06 Design criteria monograph for valve assemblies LEWIS-12332 B74-10227 06 Design criteria monograph on centrifugal flow turbopumps LEWIS-12346 B74-10228 06 LIQUID ROCKET PROPELLANTS Design criteria monograph for liquid propellant gas generators LEWIS-12139 B74-10008 07 Fluid dynamics test method NPO-11895 B74-10211 03 LIQUID-GAS MIXTURES Two-phase, passive separator-and-filter assembly LANGLEY-10976 B74-10133 04 LOADS (FORCES) Prediction of unsteady aerodynamic loadings caused by trailing-edge control-surface motions in subsonic
Rapid method for determining nitrogen in tantalum and niobium alloys LEWIS-12237 B74-10085 04 L L LABORATORY EQUIPMENT Automated single-slide staining system LANGLEY-11649 B74-10188 05 Liquid sample processor NPO-13136 B74-10278 05 LAMINAR BOUNDARY LAYER Computer program for calculating laminar, transitional, and turbulent boundary layers for a compressible axisymmetric flow LEWIS-12178 B74-10129 09 LAMINATES Computer program for buckling loads of orthotropic laminated stiffened panels subjected to biaxial in-place loads (BUCLASP 2) LANGLEY-11199 B74-10203 09 Laminating cored, stressed-face, sandwich structures	LEAKAGE Improved circumferential shaft seal LEWIS-11873 Electrometer system measures nanoamps at high voltage LEWIS-12267 B74-10064 01 LENSES Acoustic-optic deflector telescope M-FS-23107 B74-10293 03 LEVEL (HORIZONTAL) Self-leveling load table M-FS-22039 B74-10144 06 LIFE SUPPORT SYSTEMS Programmed-pressure air supply for positive-pressure breathing system ARC-10845 B74-10075 05 Spacecraft oxygen recovery system ARC-10868 B74-10220 05 LIFT FANS Computation of aerodynamic interference between lifting surfaces and lift- and cruise-fans ARC-10833 B74-10113 09 LIFTING BODIES Prediction of unsteady aerodynamic loadings caused by trailing-edge control-surface motions in subsonic compressible flow LANGLEY-11175 B74-10091 06	Design criteria monograph on turbopump shafts and couplings LEWIS-12204 B74-10014 07 Propellant acquisition device for use with a spinning toroidal tank ARC-10840 B74-10059 06 Design criteria monograph for valve components LEWIS-12327 B74-10087 06 Design criteria monograph for valve assemblies LEWIS-12332 B74-10227 06 Design criteria monograph on centrifugal flow turbopumps LEWIS-12336 B74-10228 06 LIQUID ROCKET PROPELLANTS Design criteria monograph for liquid propellant gas generators LEWIS-12139 B74-10008 07 Fluid dynamics test method NPO-11895 B74-10211 03 LIQUID-GAS MIXTURES Two-phase, passive separator-and-filter assembly LANGLEY-10976 B74-10133 04 LOADS (FORCES) Prediction of unsteady aerodynamic loadings caused by trailing-edge control-surface motions in subsonic compressible flow
Rapid method for determining nitrogen in tantalum and niobium alloys LEWIS-12237 B74-10085 04 L L LABORATORY EQUIPMENT Automated single-slide staining system LANGLEY-11649 B74-10188 05 Liquid sample processor NPO-13136 B74-10278 05 LAMINAR BOUNDARY LAYER Computer program for calculating laminar, transitional, and turbulent boundary layers for a compressible axisymmetric flow LEWIS-12178 B74-10129 09 LAMINATES Computer program for buckling loads of orthotropic laminated stiffened panels subjected to biaxial in-place loads (BUCLASP 2) LANGLEY-11199 B74-10203 09 Laminating cored, sandwich structures XLA-11028 B74-10233 06	LEAKAGE Improved circumferential shaft seal LEWIS-11873 Electrometer system measures nanoamps at high voltage LEWIS-12267 B74-10064 01 LENSES Acoustic-optic deflector telescope M-FS-23107 B74-10293 03 LEVEL (HORIZONTAL) Self-leveling load table M-FS-22039 B74-10144 06 LIFE SUPPORT SYSTEMS Programmed-pressure air supply for positive-pressure breathing system ARC-10845 B74-10075 05 Spacecraft oxygen recovery system ARC-10868 B74-10220 05 LIFT FANS Computation of aerodynamic interference between lifting surfaces and lift- and cruise-fans ARC-10833 B74-10113 09 LIFTING BODIES Prediction of unsteady aerodynamic loadings caused by control-surface motions compressible flow LANGLEY-11175 B74-10091 06 LIFTING ROTORS	Design criteria monograph on turbopump shafts and couplings LEWIS-12204 B74-10014 07 Propellant acquisition device for use with a spinning toroidal tank ARC-10840 B74-10059 06 Design criteria monograph for valve components LEWIS-12327 B74-10087 06 Design criteria monograph for valve assemblies LEWIS-12332 B74-10227 06 Design criteria monograph on centrifugal flow turbopumps LEWIS-12346 B74-10228 06 LIQUID ROCKET PROPELLANTS Design criteria monograph for liquid propellant gas generators LEWIS-12139 B74-10008 07 Fluid dynamics test method NPO-11895 B74-10008 07 Fluid dynamics test method NPO-11895 B74-1011 03 LIQUID-GAS MIXTURES Two-phase, passive separator-and-filter assembly LANGLEY-10976 B74-10133 04 LOADS (FORCES) Prediction of unsteady aerodynamic loadings caused by trailing-edge control-surface motions in subsonic compressible flow LANGLEY-11175 B74-10091 06
Rapid method for determining nitrogen in tantalum and niobium alloys LEWIS-12237 B74-10085 04 L L LABORATORY EQUIPMENT Automated single-slide staining system LANGLEY-11649 B74-10188 05 Liquid sample processor NPO-13136 B74-10278 05 LAMINAR BOUNDARY LAYER Computer program for calculating laminar, transitional, and turbulent boundary layers for a compressible axisymmetric flow LEWIS-12178 B74-10129 09 LAMINATES Computer program for buckling loads of orthotropic laminated stiffened panels subjected to biaxial in-place loads (BUCLASP 2) LANGLEY-11199 B74-10203 09 Laminating cored, stressed-face, sandwich structures	LEAKAGE Improved circumferential shaft seal LEWIS-11873 Electrometer system measures nanoamps at high voltage LEWIS-12267 B74-10064 01 LENSES Acoustic-optic deflector telescope M-FS-23107 B74-10293 03 LEVEL (HORIZONTAL) Self-leveling load table M-FS-22039 B74-10144 06 LIFE SUPPORT SYSTEMS Programmed-pressure air supply for positive-pressure breathing system ARC-10845 B74-10075 05 Spacecraft oxygen recovery system ARC-10868 B74-10220 05 LIFT FANS Computation of aerodynamic interference between lifting surfaces and lift- and cruise-fans ARC-10833 B74-10113 09 LIFTING BODIES Prediction of unsteady aerodynamic loadings caused by trailing-edge control-surface motions in subsonic compressible flow LANGLEY-11175 B74-10091 06 LIFTING ROTORS Swashplate feedback control for tilt-rotor	Design criteria monograph on turbopump shafts and couplings LEWIS-12204 B74-10014 07 Propellant acquisition device for use with a spinning toroidal tank ARC-10840 B74-10059 06 Design criteria monograph for valve components LEWIS-12327 B74-10087 06 Design criteria monograph for valve assemblies LEWIS-12332 B74-10227 06 Design criteria monograph on centrifugal flow turbopumps LEWIS-12346 B74-10228 06 LIQUID ROCKET PROPELLANTS Design criteria monograph for liquid propellant gas generators LEWIS-12139 B74-10008 07 Fluid dynamics test method NPO-11895 B74-10211 03 LIQUID-GAS MIXTURES Two-phase, passive separator-and-filter assembly LANGLEY-10976 B74-10133 04 LOADS (FORCES) Prediction of unsteady aerodynamic loadings caused by trailing-edge control-surface motions in subsonic compressible flow LANGLEY-11175 B74-10091 06
Rapid method for determining nitrogen in tantalum and niobium alloys LEWIS-12237 B74-10085 04 L L LABORATORY EQUIPMENT Automated single-slide staining system LANGLEY-11649 B74-10188 05 Liquid sample processor NPO-13136 B74-10278 05 LAMINAR BOUNDARY LAYER Computer program for calculating laminar, transitional, and turbulent boundary layers for a compressible axisymmetric flow LEWIS-12178 B74-10129 09 LAMINATES Computer program for buckling loads of orthotropic laminated stiffened panels subjected to biaxial in-place loads (BUCLASP 2) LANGLEY-11199 B74-10203 09 Laminating cored, sandwich structures XLA-11028 B74-10233 06 Advanced fiber-composite hybridsA	LEAKAGE Improved circumferential shaft seal LEWIS-11873 Electrometer system measures nanoamps at high voltage LEWIS-12267 B74-10064 01 LENSES Acoustic-optic deflector telescope M-FS-23107 B74-10293 03 LEVEL (HORIZONTAL) Self-leveling load table M-FS-22039 B74-10144 06 LIFE SUPPORT SYSTEMS Programmed-pressure air supply for positive-pressure breathing system ARC-10845 B74-10075 05 Spacecraft oxygen recovery system ARC-10868 B74-10220 05 LIFT FANS Computation of aerodynamic interference between lifting surfaces and lift- and cruise-fans ARC-10833 B74-10113 09 LIFTING BODIES Prediction of unsteady aerodynamic loadings caused by control-surface motions compressible flow LANGLEY-11175 B74-10091 06 LIFTING ROTORS	Design criteria monograph on turbopump shafts and couplings LEWIS-12204 B74-10014 07 Propellant acquisition device for use with a spinning toroidal tank ARC-10840 B74-10059 06 Design criteria monograph for valve components LEWIS-12327 B74-10087 06 Design criteria monograph for valve assemblies LEWIS-12332 B74-10227 06 Design criteria monograph on centrifugal flow turbopumps LEWIS-12346 B74-10228 06 LIQUID ROCKET PROPELLANTS Design criteria monograph for liquid propellant gas generators LEWIS-12139 B74-10008 07 Fluid dynamics test method NPO-11895 B74-10008 07 Fluid dynamics test method NPO-11895 B74-1011 03 LIQUID-GAS MIXTURES Two-phase, passive separator-and-filter assembly LANGLEY-10976 B74-10133 04 LOADS (FORCES) Prediction of unsteady aerodynamic loadings caused by trailing-edge control-surface motions in subsonic compressible flow LANGLEY-11175 B74-10091 06
Rapid method for determining nitrogen in tantalum and niobium alloys LEWIS-12237 B74-10085 04 L L LABORATORY EQUIPMENT Automated single-slide staining system LANGLEY-11649 B74-10188 05 Liquid sample processor NPO-13136 B74-10278 05 LAMINAR BOUNDARY LAYER Computer program for calculating laminar, transitional, and turbulent boundary layers for a compressible axisymmetric flow LEWIS-12178 B74-10129 09 LAMINATES Computer program for buckling loads of orthotropic laminated stiffened panels subjected to biaxial in-place loads (BUCLASP 2) LANGLEY-11199 B74-10203 09 Laminating cored, stressed-face, sandwich structures XLA-11028 B74-10233 06 Advanced fiber-composite hybridsA new structural material LEWIS-12118 B74-10247 04 LANDING AIDS	LEAKAGE Improved circumferential shaft seal LEWIS-11873 Electrometer system measures nanoamps at high voltage LEWIS-12267 B74-10064 01 LENSES Acoustic-optic deflector telescope M-FS-23107 B74-10293 03 LEVEL (HORIZONTAL) Self-leveling load table M-FS-22039 B74-10144 06 LIFE SUPPORT SYSTEMS Programmed-pressure air supply for positive-pressure breathing system ARC-10845 B74-10075 05 Spacecraft oxygen recovery system ARC-10868 B74-10220 05 LIFT FANS Computation of aerodynamic interference between lifting surfaces and lift- and cruise-fans ARC-10833 B74-10113 09 LIFTING BODIES Prediction of unsteady aerodynamic loadings caused by trailing-edge control-surface motions in subsonic compressible flow LANGLEY-11175 B74-10091 06 LIFTING ROTORS Swashplate feedback control for tilt-rotor aircraft ARC-10854 B74-10174 06 LIGHT (VISIBLE RADIATION)	Design criteria monograph on turbopump shafts and couplings LEWIS-12204 B74-10014 07 Propellant acquisition device for use with a spinning toroidal tank ARC-10840 B74-10059 06 Design criteria monograph for valve components LEWIS-12327 B74-10087 06 Design criteria monograph for valve assemblies LEWIS-12332 B74-10227 06 Design criteria monograph on centrifugal flow turbopumps LEWIS-12332 B74-10228 06 LIQUID ROCKET PROPELLANTS Design criteria monograph for liquid propellant gas generators LEWIS-12139 B74-10008 07 Fluid dynamics test method NPO-11895 B74-10211 03 LIQUID-GAS MIXTURES Two-phase, passive separator-and-filter assembly LANGLEY-10976 B74-10133 04 LOADS (FORCES) Prediction of unsteady aerodynamic loadings caused by trailing-edge control-surface motions in subsonic compressible flow LANGLEY-11175 B74-10091 06 LOGARITHMS Logarithmic-function generator ERC-10267 B74-10285 02
Rapid method for determining nitrogen in tantalum and niobium alloys LEWIS-12237 B74-10085 04 L L LABORATORY EQUIPMENT Automated single-slide staining system LANGLEY-11649 B74-10188 05 Liquid sample processor NPO-13136 B74-10278 05 LAMINAR BOUNDARY LAYER Computer program for calculating laminar, transitional, and turbulent boundary layers for a compressible axisymmetric flow LEWIS-12178 B74-10129 09 LAMINATES Computer program for buckling loads of orthotropic laminated stiffened panels subjected to biaxial in-place loads (BUCLASP 2) LANGLEY-11199 B74-10203 09 Laminating cored, sandwich structures XLA-11028 B74-10233 06 Advanced fiber-composite hybridsA new structural material LEWIS-12118 B74-10247 04	LEAKAGE Improved circumferential shaft seal LEWIS-11873 Electrometer system measures nanoamps at high voltage LEWIS-12267 B74-10064 01 LENSES Acoustic-optic deflector telescope M-FS-23107 B74-10293 03 LEVEL (HORIZONTAL) Self-leveling load table M-FS-2039 Programmed-pressure air supply for positive-pressure breathing system ARC-10845 B74-10075 05 Spacecraft oxygen recovery system ARC-10868 B74-10220 05 LIFT FANS Computation of aerodynamic interference between lifting surfaces and lift- and cruise-fans ARC-10833 B74-10113 09 LIFTING BODIES Prediction of unsteady aerodynamic loadings caused by trailing-edge control-surface motions compressible flow LANGLEY-11175 B74-10091 06 LIFTING ROTORS Swashplate feedback control for tilt-rotor aircraft ARC-10854 B74-10174 06	Design criteria monograph on turbopump shafts and couplings LEWIS-12204 B74-10014 07 Propellant acquisition device for use with a spinning toroidal tank ARC-10840 B74-10059 06 Design criteria monograph for valve components LEWIS-12327 B74-10087 06 Design criteria monograph for valve assemblies LEWIS-12332 B74-10227 06 Design criteria monograph on centrifugal flow turbopumps LEWIS-12346 B74-10228 06 LIQUID ROCKET PROPELLANTS Design criteria monograph for liquid propellant gas generators LEWIS-12139 B74-10008 07 Fluid dynamics test method NPO-11895 B74-10211 03 LIQUID-GAS MIXTURES Two-phase, passive separator-and-filter assembly LANGLEY-10976 B74-10133 04 LOADS (FORCES) Prediction of unsteady aerodynamic loadings caused by trailing-edge control-surface motions in subsonic compressible flow LANGLEY-11175 B74-10091 06 LOGARITHMS Logarithmic-function generator ERC-10267 B74-10285 02

Data processor with conditionally	MAGNETIC COMPASSES	MATHEMATICAL TABLES
supplied clock signals	Magnetic-heading reference device	Zeros of certain cross products of Bessel
GSFC-10975 B74-10021 02	LANGLEY-11387 B74-10176 02	functions of fractional order
Temperature compensation of digital	MAGNETIC FIELDS	LEWIS-12221 874-10012 03
inertial sensors	Magnetic bearings with combined radial	MEASURING INSTRUMENTS
NPO-13044 B74-10106 02	and axial control	Low cost instrumentation amplifier
Error-correcting codes for high-speed	GSFC-11551 B74-10131 06	LEWIS-12222 B74-10015 01
digital computers	MAGNETIC FILMS	Combustion products generating and
M-FS-22887 B74-10147 02	Depositing spacing layers on magnetic	metering device
LOGIC DESIGN	film with liquid phase epitaxy	GSFC-11095 B74-10036 04
Modular digital computer system	LANGLEY-11528 B74-10262 01	Magnetometer with miniature transducer
design	MAGNETOMETERS	and automatic transducer scanning
M-FS-22935 B74-10034 09	Magnetometer with miniature transducer	apparatus
Computerized logic design of digital	and automatic transducer scanning	LANGLEY-11617 B74-10142 02
circuits	apparatus	Pocket gauge for checking insert clocking
M-FS-22401 B74-10225 09	LANGLEY-11617 B74-10142 02	of multipin circular connectors
LOW DENSITY MATERIALS	Magnetic-heading reference device	NPO-11924 B74-10160 01
		MECHANICAL DEVICES
foams	MAINTENANCE -	Improved geneva mechanism
LANGLEY-11325 B74-10135 06	Automated maintenance for complex	LANGLEY-11443 B74-10030 06
LOW FREQUENCIES	hybrid systems	Precision glasscutter
Electronic high pass filter	NPO-13143 B74-10279 09	LANGLEY-11604 B74-10031 07
	MALFUNCTIONS	Computer program for spacecraft-booster
LOW PASS FILTERS	Error-correcting codes for high-speed	separation spring selection, set
Low-distortion receiver for bilevel,	digital computers	composition, and location determination
baseband PCM waveforms	M-FS-22887 B74-10147 02	GSFC-11616 B74-10037-09
MSC-14557 B74-10025 02	MANNED SPACECRAFT	Heat-transfer thermal switch
LOW TEMPERATURE	Graphics shadowing analysis	LANGLEY-11232 B74-10092 06
Shutoff and throttling valve	M-FS-21406 B74-10040 09	Apparatus for heat treating plastic belts
NPO-11951 · B74-10105 07	MAPPING	NPO-13205 B74-10299 02
Low-temperture electrostatic	Analysis of orbital heat transfer	MECHANICAL DRIVES
silicon-to-silicon seals using sputtered	ARC-10842 B74-10115 02	
borosilicate glass		Solar array deployment from a spinning
	MAPS	spacecraft
LANGLEY-11589 B74-10263 08	Color-coded area sensitivity maps of	ARC-10787 B74-10048 06
LOW WEIGHT	photomultipliers	MECHANICAL IMPEDANCE
Light-weight spherical submergence	LANGLEY-10320 B74-10259 01	In vivo measurement of mechanical
vessel	MARKING	impedance of bone
ARC-10838 B74-10114 08	Process to restore obliterated serial	ARC-10857 B74-10245 05
Lead-oxygen closed-loop battery system	numbers on metal surfaces	MECHANICAL MEASUREMENT
M-FS-23059 B74-10267 06	LEWIS-12085 B74-10020 07	Computer program for spacecraft-booster
LUBRICATION	Automatic marker for photographic film	separation spring selection, set
Plasma-sprayed metal-glass fluoride	MSC-14705 B74-10152 03	composition, and location determination
coatings for lubrication to 1170 K (1650	MASERS	GSFC-11616 B74-10037 09
- F)		MECHANICAL PROPERTIES
LEWIS-11930 B74-10016 04		Miniature biaxial strain transducer
Magnetic bearings with combined radial	superconducting magnet systems	LANGLEY-11648 B74-10180 01
and axial control	NPO-11875 B74-10158 02	Thermoelastic analysis of solar cell arrays
GSFC-11551 B74-10131 06	MASS SPECTROMETERS	and their material properties
LUBRICATION SYSTEMS	Graphite ionization vacuum gauge	NPO-13458 B74-10301 03
Improved circumferential shaft seal	LANGLEY-11338 B74-10136 03	MECHANIZATION
LEWIS-11873 B74-10062 07	Negative ion spectrometry for detecting	
	nitrated explosives	Automatic marker for photographic film MSC-14705 874-10152 03
LUMINAIRES	NPO-13082 B74-10276 02	
A low cost "Air Mass 2" solar		MEDICAL EQUIPMENT
simulator	MASS SPECTROSCOPY	Very high voltage latching relay
LEWIS-12266 B74-10086 02	Micrometeoroid velocity-and-trajectory	LEWIS-12265 B74-10079 01
	analyzer	Therapeutic hand-exercising device with
	GSFC-11889 B74-10286 01	cycling pressure value
M	MATERIALS HANDLING	LANGLEY-11579 B74-10140 05
	Guidebook of nondestructive evaluation	MEDICAL PERSONNEL
MACHINE TOOLS	techniques for materials and structures	Liquid-cooled liner for helmets
		Liquid-cooled liner for helmets ARC-10534 B74-10249 05
· Dynamometer for measuring machining	techniques for materials and structures LEWIS-12272 B74-10122 04	
 Dynamometer for measuring machining forces in two perpendicular directions 	techniques for materials and structures LEWIS-12272 B74-10122 04 MATHEMATICAL MODELS	ARC-10534 B74-10249 05
· Dynamometer for measuring machining	techniques for materials and structures B74-10122 04 MATHEMATICAL MODELS Model optimization using statistical	ARC-10534 B74-10249 05 MELTING POINTS
 Dynamometer for measuring machining forces in two perpendicular directions 	techniques for materials and structures LEWIS-12272 B74-10122 04 MATHEMATICAL MODELS Model optimization using statistical estimation	ARC-10534 B74-10249 05 MELTING POINTS Binary alloys for refractory-metal
Dynamometer for measuring machining forces in two perpendicular directions M-FS-22899 B74-10148 07	techniques for LEWIS-12272 materials and structures B74-10122 04 MATHEMATICAL MODELS Model optimization using statistical estimation M-FS-22873 B74-10189 09	ARC-10534 B74-10249 05 MELTING POINTS Binary alloys for refractory-metal brazing
Dynamometer for measuring machining forces in two perpendicular directions M-FS-22899 B74-10148 07 Flange design for large-scale modular	techniques for LEWIS-12272 materials and structures B74-10122 04 MATHEMATICAL MODELS Model optimization using statistical estimation M-FS-22873 B74-10189 09 Computer program for stress, stability,	ARC-10534 B74-10249 05 MELTING POINTS Binary alloys for refractory-metal brazing LEWIS-12184 B74-10125 08
Dynamometer for measuring machining forces in two perpendicular directions M-FS-22899 B74-10148 07 Flange design for large-scale modular assembly jigs MSC-19372 B74-10273 06	techniques for LEWIS-12272 materials and structures B74-10122 04 MATHEMATICAL MODELS Model optimization using statistical estimation M-FS-22873 B74-10189 09 Computer program for stress, stability, and vibration of complex branched shells	ARC-10534 B74-10249 05 MELTING POINTS Binary alloys for refractory-metal brazing LEWIS-12184 B74-10125 08 METAL AIR BATTERIES
Dynamometer for measuring machining forces in two perpendicular directions M-FS-22899 B74-10148 07 Flange design for large-scale modular assembly jigs	techniques for LEWIS-12272 materials and structures B74-10122 04 MATHEMATICAL MODELS Model optimization using statistical estimation M-FS-22873 B74-10189 09 Computer program for stress, stability, and vibration of complex branched shells of revolution: BOSOR 4	ARC-10534 B74-10249 05 MELTING POINTS Binary alloys for refractory-metal brazing LEWIS-12184 B74-10125 08 METAL AIR BATTERIES Lead-oxygen closed-loop battery system
Dynamometer for measuring machining forces in two perpendicular directions M-FS-22899 B74-10148 07 Flange design for large-scale modular assembly jigs MSC-19372 B74-10273 06 MAGNETIC ANOMALIES Magnetometer with miniature transducer	techniques for LEWIS-12272 materials and structures B74-10122 04 MATHEMATICAL MODELS Model optimization using statistical estimation M-FS-22873 B74-10189 09 Computer program for stress, stability, and vibration of complex branched shells	ARC-10534 B74-10249 05 MELTING POINTS Binary alloys for refractory-metal brazing LEWIS-12184 B74-10125 08 METAL AIR BATTERIES Lead-oxygen closed-loop battery system M-FS-23059 B74-10267 06 METAL COATINGS
Dynamometer for measuring machining forces in two perpendicular directions M-FS-22899 B74-10148 07 Flange design for large-scale modular assembly jigs MSC-19372 B74-10273 06 MAGNETIC ANOMALIES Magnetometer with miniature transducer and automatic transducer scanning	techniques for LEWIS-12272 materials and structures B74-10122 04 MATHEMATICAL MODELS Model optimization using statistical estimation M-FS-22873 B74-10189 09 Computer program for stress, stability, and vibration of complex branched shells of revolution: BOSOR 4	ARC-10534 B74-10249 05 MELTING POINTS Binary alloys for refractory-metal brazing LEWIS-12184 B74-10125 08 METAL AIR BATTERIES Lead-oxygen closed-loop battery system M-FS-23059 B74-10267 06 METAL COATINGS Lightweight, high speed bearing balls:
Dynamometer for measuring machining forces in two perpendicular directions M-FS-22899 B74-10148 07 Flange design for large-scale modular assembly jigs MSC-19372 B74-10273 06 MAGNETIC ANOMALIES Magnetometer with miniature transducer and automatic transducer scanning apparatus	techniques for LEWIS-12272 materials and structures B74-10122 04 MATHEMATICAL MODELS Model optimization using statistical estimation M-FS-22873 B74-10189 09 Computer program for stress, stability, and vibration of complex branched shells of revolution: BOSOR 4 LANGLEY-11209 B74-10205 09	ARC-10534 B74-10249 05 MELTING POINTS Binary alloys for refractory-metal brazing LEWIS-12184 B74-10125 08 METAL AIR BATTERIES Lead-oxygen closed-loop battery system M-FS-23059 B74-10267 06 METAL COATINGS Lightweight, high speed bearing balls: A concept
Dynamometer for measuring machining forces in two perpendicular directions M-FS-22899 B74-10148 07 Flange design for large-scale modular assembly jigs MSC-19372 B74-10273 06 MAGNETIC ANOMALIES Magnetometer with miniature transducer and automatic transducer scanning apparatus LANGLEY-11617 B74-10142 02	techniques for LEWIS-12272 materials and structures B74-10122 04 MATHEMATICAL MODELS Model optimization using statistical estimation M-FS-22873 B74-10189 09 Computer program for stress, stability, and vibration of complex branched shells of revolution: BOSOR 4 LANGLEY-11209 B74-10205 09 Investigation of exit-velocity stratification	ARC-10534 B74-10249 05 MELTING POINTS Binary alloys for refractory-metal brazing LEWIS-12184 B74-10125 08 METAL AIR BATTERIES Lead-oxygen closed-loop battery system M-FS-23059 B74-10267 06 METAL COATINGS Lightweight, high speed bearing balls: A concept LEWIS-11087 B74-10013 06
Dynamometer for measuring machining forces in two perpendicular directions M-FS-22899 B74-10148 07 Flange design for large-scale modular assembly jigs MSC-19372 B74-10273 06 MAGNETIC ANOMALIES Magnetometer with miniature transducer and automatic transducer scanning apparatus LANGLEY-11617 B74-10142 02 MAGNETIC COILS	techniques for LEWIS-12272 B74-10122 04 MATHEMATICAL MODELS Model optimization using statistical estimation M-FS-22873 B74-10189 09 Computer program for stress, stability, and vibration of complex branched shells of revolution: BOSOR 4 LANGLEY-11209 B74-10205 09 Investigation of exit-velocity stratification effects on jets in a crossflow (STRJET) LANGLEY-11581 B74-10207 09	ARC-10534 B74-10249 05 MELTING POINTS Binary alloys for refractory-metal brazing LEWIS-12184 B74-10125 08 METAL AIR BATTERIES Lead-oxygen closed-loop battery system M-FS-23059 B74-10267 06 METAL COATINGS Lightweight, high speed bearing balls: A concept LEWIS-11087 B74-10013 06 METAL CUTTING
Dynamometer for measuring machining forces in two perpendicular directions M-FS-22899 B74-10148 07 Flange design for large-scale modular assembly jigs MSC-19372 B74-10273 06 MAGNETIC ANOMALIES Magnetometer with miniature transducer and automatic transducer scanning apparatus LANGLEY-11617 B74-10142 02 MAGNETIC COILS Improved magnetic suspension	techniques for LEWIS-12272 B74-10122 04 MATHEMATICAL MODELS Model optimization using statistical estimation M-FS-22873 B74-10189 09 Computer program for stress, stability, and vibration of complex branched shells of revolution: BOSOR 4 LANGLEY-11209 B74-10205 09 Investigation of exit-velocity stratification effects on jets in a crossflow (STRJET) LANGLEY-11581 B74-10207 09 Calculation of aerodynamic	ARC-10534 B74-10249 05 MELTING POINTS Binary alloys for refractory-metal brazing LEWIS-12184 B74-10125 08 METAL AIR BATTERIES Lead-oxygen closed-loop battery system M-FS-23059 B74-10267 06 METAL COATINGS Lightweight, high speed bearing balls: A concept LEWIS-11087 B74-10013 06 METAL CUTTING Dynamometer for measuring machining
Dynamometer for measuring machining forces in two perpendicular directions M-FS-22899 B74-10148 07 Flange design for large-scale modular assembly jigs MSC-19372 B74-10273 06 MAGNETIC ANOMALIES Magnetometer with miniature transducer and automatic transducer scanning apparatus LANGLEY-11617 B74-10142 02 MAGNETIC COILS	techniques for LEWIS-12272 B74-10122 04 MATHEMATICAL MODELS Model optimization using statistical estimation M-FS-22873 B74-10189 09 Computer program for stress, stability, and vibration of complex branched shells of revolution: BOSOR 4 LANGLEY-11209 B74-10205 09 Investigation of exit-velocity stratification effects on jets in a crossflow (STRJET) LANGLEY-11581 B74-10207 09	ARC-10534 B74-10249 05 MELTING POINTS Binary alloys for refractory-metal brazing LEWIS-12184 B74-10125 08 METAL AIR BATTERIES Lead-oxygen closed-loop battery system M-FS-23059 B74-10267 06 METAL COATINGS Lightweight, high speed bearing balls: A concept LEWIS-11087 B74-10013 06 METAL CUTTING

METAL FATIGUE	MINICOMPUTERS	MULTIPLEXING
Lightweight, high speed bearing balls:	Minicomputer-controlled frequency	Wireless telemetry system for floating
A concept LEWIS-11087 B74-10013 06	generator NPO-11962 B74-10163 02	bodies KSC-10855 B74-10028 06
LEWIS-11087 B74-10013 06 METAL FOILS	- · · · · · · · · · · · · · · · · · · ·	Interplex modulation and a
Advanced fiber-composite hybridsA	Advanced-priority interrupt module NPO-13067 B74-10165 02	
new structural material	MINING	coherent communications systems
LEWIS-12118 B74-10247 04	Liquid-cooled liner for helmets	NPO-11572 B74-10209 01
METAL MATRIX COMPOSITES	ARC-10534 B74-10249 05	High-efficiency multifrequency feed
Plasma-sprayed metal-glass fluoride	MIRRORS	GSFC-11909 B74-10288 02
coatings for lubrication to 1170 K (1650 F)	Inexpensive lightweight mirror	MULTIPLIERS Improved channel multiplier for
LEWIS-11930 B74-10016 04	MSC-14615 B74-10155 05	radiation-and-particle detectors
High strength, wire-reinforced	Combined effects of a converging beam	NPO-12128 B74-10275 03
electroformed structures	of light and mirror misalignment in michelson interferometry	MULTIPROGRAMMING
LEWIS-12087 B74-10018 08	ARC-10889 B74-10246 03	Modular digital computer system
METAL OXIDE SEMICONDUCTORS Radiation hardening of metal-oxide	MISALIGNMENT	design M-FS-22935 B74-10034 09
semiconductor (MOS) devices by boron	Combined effects of a converging beam	MUSCULAR FUNCTION
GSFC-11425 B74-10026 01	of light and mirror misalignment in	Compact telemetry package for remote
METAL SURFACES	michelson interferometry ARC-10889 B74-10246 03	monitoring of neutron responses in
Surface roughness measured by optical	MISSILE COMPONENTS	animals
signatures ARC-10853 B74-10118 03	Cobalt base superalloy has outstanding	NPO-11887 B74-10103 05
METAL WORKING	properties up to 1478 K (2200 F)	
Mechanical rod peening	LEWIS-12089 B74-10081 03	A.I
M-FS-23047 B74-10237 07	MODULATION	N
METAL-METAL BONDING	Interplex, modulation and a	
Casting copper to tungsten for high-power arc lamp cathodes	suppressed-carrier tracking loop for coherent communications systems	N-TYPE SEMICONDUCTORS
LEWIS-12169 B74-10011 04	NPO-11572 B74-10209 01	Efficiency increased in new solar cell: A Concept
METALLIZING	MODULATORS	LANGLEY-11174 B74-10090 01
Metallized polymeric foam material	Dually-mode-locked ND: YAG laser	NETWORK ANALYSIS
ARC-10860 B74-10218 04	GSFC-11746 B74-10038 03	Generalized current distribution rule
METEOROLOGY Method for remotely sensing turbulence	MODULES	LANGLEY-11565 B74-10093 02
of planetary atmospheres	Modular support blocks for fluid lines MSC-19335 B74-10023 07	NEUROLOGY
NPO-13154 B74-10168 03	MODULUS OF ELASTICITY	Compact telemetry package for remote monitoring of neutron responses in
MICHELSON INTERFEROMETERS	Miniature biaxial strain transducer	animals
Combined effects of a converging beam	LANGLEY-11648 B74-10180 01	NPO-11887 B74-10103 05
of light and mirror misalignment in michelson interferometry	MOLDING MATERIALS	NEUTRONS
	Cushion module for stowing electronic	Lang life moutron managetor toragt voice
ARC-10889 B74-10246 03		Long life neutron generator target using
ARC-10889 B74-10246 03 MICROELECTRONICS	equipment	deuterium pass-through structure
MICROELECTRONICS High voltage solid-state relay	equipment ARC-10779 B74-10073 04	deuterium pass-through structure LEWIS-11866 B74-10063 03
MICROELECTRONICS High voltage solid-state relay LEWIS-12096 B74-10006 01	equipment	deuterium pass-through structure LEWIS-11866 B74-10063 03
MICROELECTRONICS High voltage solid-state relay LEWIS-12096 B74-10006 01 Microelectronics packaging technique: A	equipment ARC-10779 B74-10073 04 MOLDS Inexpensive lightweight mirror MSC-14615 B74-10155 05	deuterium pass-through structure LEWIS-11866 B74-10063 03 Method of measuring the thickness of
MICROELECTRONICS High voltage solid-state relay LEWIS-12096 B74-10006 01 Microelectronics packaging technique: A Concept	equipment ARC-10779 MOLDS Inexpensive lightweight mirror MSC-14615 MONITORS B74-10155 05	deuterium pass-through structure LEWIS-11866 B74-10063 03 Method of measuring the thickness of radioactive thin films LEWIS-11971 B74-10065 03 A high yield neutron target
MICROELECTRONICS High voltage solid-state relay LEWIS-12096 B74-10006 01 Microelectronics packaging technique: A Concept	equipment ARC-10779 B74-10073 04 MOLDS Inexpensive lightweight mirror MSC-14615 B74-10155 05 MONITORS Microelectronics packaging technique: A	deuterium pass-through structure LEWIS-11866 B74-10063 03 Method of measuring the thickness of radioactive thin films LEWIS-11971 B74-10065 03 A high yield neutron target LEWIS-12058 B74-10066 03
MICROELECTRONICS High voltage solid-state relay LEWIS-12096 B74-10006 01 Microelectronics packaging technique: A Concept MSC-19399 B74-10192 01 MICROMETEOROIDS Micrometeoroid velocity-and-trajectory	equipment ARC-10779 MOLDS Inexpensive lightweight mirror MSC-14615 MONITORS B74-10155 05	deuterium pass-through structure LEWIS-11866 B74-10063 03 Method of measuring the thickness of radioactive thin films LEWIS-11971 B74-10065 03 A high yield neutron target LEWIS-12058 B74-10066 03 NICHROME (TRADEMARK)
MICROELECTRONICS High voltage solid-state relay LEWIS-12096 B74-10006 01 Microelectronics packaging technique: A Concept MSC-19399 B74-10192 01 MICROMETEOROIDS Micrometeoroid velocity-and-trajectory analyzer	equipment ARC-10779 B74-10073 04 MOLDS Inexpensive lightweight mirror MSC-14615 B74-10155 05 MONITORS Microelectronics packaging technique: A Concept MSC-19399 B74-10192 01 Carbon monoxide detector	deuterium pass-through structure LEWIS-11866 B74-10063 03 Method of measuring the thickness of radioactive thin films LEWIS-11971 B74-10065 03 A high yield neutron target LEWIS-12058 B74-10066 03 NICHROME (TRADEMARK) Plasma-sprayed metal-glass fluoride
MICROELECTRONICS High voltage solid-state relay LEWIS-12096 B74-10006 01 Microelectronics packaging technique: A Concept MSC-19399 B74-10192 01 MICROMETEOROIDS Micrometeoroid velocity-and-trajectory analyzer GSFC-11889 B74-10286 01	equipment ARC-10779 B74-10073 04 MOLDS Inexpensive lightweight mirror MSC-14615 B74-10155 05 MONITORS Microelectronics packaging technique: A Concept MSC-19399 B74-10192 01 Carbon monoxide detector M-FS-23090 B74-10268 04	deuterium pass-through structure LEWIS-11866 B74-10063 03 Method of measuring the thickness of radioactive thin films LEWIS-11971 B74-10065 03 A high yield neutron target LEWIS-12058 B74-10066 03 NICHROME (TRADEMARK) Plasma-sprayed metal-glass fluoride
MICROELECTRONICS High voltage solid-state relay LEWIS-12096 B74-10006 01 Microelectronics packaging technique: A Concept MSC-19399 B74-10192 01 MICROMETEOROIDS Micrometeoroid velocity-and-trajectory analyzer	equipment ARC-10779 B74-10073 04 MOLDS Inexpensive lightweight mirror MSC-14615 B74-10155 05 MONITORS Microelectronics packaging technique: A Concept MSC-19399 B74-10192 01 Carbon monoxide detector M-FS-23090 B74-10268 04 Location of vehicles using AM station	deuterium pass-through structure LEWIS-11866 B74-10063 03 Method of measuring the thickness of radioactive thin films LEWIS-11971 B74-10065 03 A high yield neutron target LEWIS-12058 B74-10066 03 NICHROME (TRADEMARK) Plasma-sprayed metal-glass fluoride coatings for lubrication to 1170 K (1650 F)
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MICROELECTRONICS High voltage solid-state relay LEWIS-12096 B74-10006 01 Microelectronics packaging technique: A Concept MSC-19399 B74-10192 01 MICROMETEOROIPS Micrometeoroid velocity-and-trajectory analyzer GSFC-11889 B74-10286 01 Micrometeoroid composition analyzer GSFC-11892 B74-10287 01 MICROMINIATURIZATION Reduction of quantization error in measurement of frequency	equipment ARC-10779 B74-10073 04 MOLDS Inexpensive lightweight mirror MSC-14615 B74-10155 05 MONITORS Microelectronics packaging technique: A Concept MSC-19399 B74-10192 01 Carbon monoxide detector M-FS-23090 B74-10268 04 Location of vehicles using AM station broadcasting signals	deuterium pass-through structure LEWIS-11866 B74-10063 03 Method of measuring the thickness of radioactive thin films LEWIS-11971 B74-10065 03 A high yield neutron target LEWIS-12058 B74-10066 03 NICHROME (TRADEMARK) Plasma-sprayed metal-glass fluoride coatings for lubrication to 1170 K (1650 F) LEWIS-11930 B74-10016 04 NICKEL High strength, wire-reinforced electroformed structures
MICROELECTRONICS High voltage solid-state relay LEWIS-12096 B74-10006 01 Microelectronics packaging technique: A Concept MSC-19399 B74-10192 01 MICROMETEOROIDS Micrometeoroid velocity-and-trajectory analyzer GSFC-11889 B74-10286 01 Micrometeoroid composition analyzer GSFC-11892 B74-10287 01 MICROMINIATURIZATION Reduction of quantization error in measurement of frequency MSC-14649 B74-10191 02	equipment ARC-10779 B74-10073 04 MOLDS Inexpensive lightweight mirror MSC-14615 B74-10155 05 MONITORS Microelectronics packaging technique: A Concept MSC-19399 B74-10192 01 Carbon monoxide detector M-FS-23090 B74-10268 04 Location of vehicles using AM station broadcasting signals NPO-13217 B74-10300 02 MONOCHROMATIC RADIATION	deuterium pass-through structure LEWIS-11866 B74-10063 03 Method of measuring the thickness of radioactive thin films LEWIS-11971 B74-10065 03 A high yield neutron target LEWIS-12058 B74-10066 03 NICHROME (TRADEMARK) Plasma-sprayed metal-glass fluoride coatings for lubrication to 1170 K (1650 F) LEWIS-11930 B74-10016 04 NICKEL High strength, wire-reinforced electroformed structures LEWIS-12087 B74-10018 08
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MICROELECTRONICS High voltage solid-state relay LEWIS-12096 B74-10006 01 Microelectronics packaging technique: A Concept MSC-19399 B74-10192 01 MICROMETEOROIDS Micrometeoroid velocity-and-trajectory analyzer GSFC-11889 B74-10286 01 Micrometeoroid composition analyzer GSFC-11892 B74-10287 01 MICROMINIATURIZATION Reduction of quantization error in measurement of frequency MSC-14649 B74-10191 02 MICROORGANISMS	equipment ARC-10779 B74-10073 04 MOLDS Inexpensive lightweight mirror MSC-14615 B74-10155 05 MONITORS Microelectronics packaging technique: A Concept MSC-19399 B74-10192 01 Carbon monoxide detector M-FS-23090 B74-10268 04 Location of vehicles using AM station broadcasting signals NPO-13217 B74-10300 02 MONOCHROMATIC RADIATION Spectrometer GSFC-11694 B74-10181 03 MOTION PICTURES Optical discriminator system LANGLEY-11580 B74-10139 03	deuterium pass-through structure LEWIS-11866 B74-10063 03 Method of measuring the thickness of radioactive thin films LEWIS-11971 B74-10065 03 A high yield neutron target LEWIS-12058 B74-10066 03 NICHROME (TRADEMARK) Plasma-sprayed metal-glass fluoride coatings for lubrication to 1170 K (1650 F) LEWIS-11930 B74-10016 04 NICKEL High strength electroformed structures LEWIS-12087 B74-10018 08 NICKEL ALLOYS A new nickel-base wrought superalloy for applications up to 1033 K (1400 F)
High voltage solid-state relay LEWIS-12096 B74-10006 01 Microelectronics packaging technique: A Concept MSC-19399 B74-10192 01 MICROMETEOROIDS Micrometeoroid velocity-and-trajectory analyzer GSFC-11889 B74-10286 01 Micrometeoroid composition analyzer GSFC-11892 B74-10287 01 MICROMINIATURIZATION Reduction of quantization error in measurement of frequency MSC-14649 B74-10191 02 MICROORGANISMS Micro-organism distribution sampling for bioassays	equipment ARC-10779 B74-10073 04 MOLDS Inexpensive lightweight mirror MSC-14615 B74-10155 05 MONITORS Microelectronics packaging technique: A Concept MSC-19399 B74-10192 01 Carbon monoxide detector M-FS-23090 B74-10268 04 Location of vehicles using AM station broadcasting signals NPO-13217 B74-10300 02 MONOCHROMATIC RADIATION Spectrometer GSEC-11694 B74-10181 03 MOTION PICTURES Optical discriminator system	deuterium pass-through structure LEWIS-11866 B74-10063 03 Method of measuring the thickness of radioactive thin films LEWIS-11971 B74-10065 03 A high yield neutron target LEWIS-12058 B74-10066 03 NICHROME (TRADEMARK) Plasma-sprayed metal-glass fluoride coatings for lubrication to 1170 K (1650 F) LEWIS-11930 B74-10016 04 NICKEL High strength, wire-reinforced electroformed structures LEWIS-12087 B74-10018 08 NICKEL ALLOYS A new nickel-base wrought superalloy for applications up to 1033 K (1400 F) LEWIS-11827 B74-10002 04 New nickel-base wrought superalloy with
MICROELECTRONICS High voltage solid-state relay LEWIS-12096 B74-10006 01 Microelectronics packaging technique: A Concept MSC-19399 B74-10192 01 MICROMETEOROIDS Micrometeoroid velocity-and-trajectory analyzer GSFC-11889 B74-10286 01 Micrometeoroid composition analyzer GSFC-11892 B74-10287 01 MICROMINIATURIZATION Reduction of quantization error in measurement of frequency MSC-14649 B74-10191 02 MICROORGANISMS Micro-organism distribution sampling for bioassays LANGLEY-10789 B74-10289 05 MICROWAVE CIRCUITS High q band-pass resonators utilizing	equipment ARC-10779 B74-10073 04 MOLDS Inexpensive lightweight mirror MSC-14615 B74-10155 05 MONITORS Microelectronics packaging technique: A Concept MSC-19399 B74-10192 01 Carbon monoxide detector M-FS-23090 B74-10268 04 Location of vehicles using AM station broadcasting signals NPO-13217 B74-10300 02 MONOCHROMATIC RADIATION Spectrometer GSEC-11694 B74-10181 03 MOTION PICTURES Optical discriminator system LANGLEY-11580 B74-10139 03 MOTION STABILITY Suppression of bending motion in elastic bodies	deuterium pass-through structure LEWIS-11866 B74-10063 03 Method of measuring the thickness of radioactive thin films LEWIS-11971 B74-10065 03 A high yield neutron target LEWIS-12058 B74-10066 03 NICHROME (TRADEMARK) Plasma-sprayed metal-glass fluoride coatings for lubrication to 1170 K (1650 F) LEWIS-11930 B74-10016 04 NICKEL High strength, wire-reinforced electroformed structures LEWIS-12087 B74-10018 08 NICKEL ALLOYS A new nickel-base wrought superalloy for applications up to 1033 K (1400 F) New nickel-base wrought superalloy with applications up to 1253 K (1800 F)
High voltage solid-state relay LEWIS-12096 B74-10006 01 Microelectronics packaging technique: A Concept MSC-19399 B74-10192 01 MICROMETEOROIDS Micrometeoroid velocity-and-trajectory analyzer GSFC-11889 B74-10286 01 Micrometeoroid composition analyzer GSFC-11892 B74-10287 01 MICROMINIATURIZATION Reduction of quantization error in measurement of frequency MSC-14649 B74-10191 02 MICROORGANISMS Micro-organism distribution sampling for bioassays LANGLEY-10789 B74-10289 05 MICROWAVE CIRCUITS High q band-pass resonators utilizing composite band-stop resonator pairs	equipment ARC-10779 B74-10073 04 MOLDS Inexpensive lightweight mirror MSC-14615 B74-10155 05 MONITORS Microelectronics packaging technique: A Concept MSC-19399 B74-10192 01 Carbon monoxide detector M-FS-23090 B74-10268 04 Location of vehicles using AM station broadcasting signals NPO-13217 B74-10300 02 MONOCHROMATIC RADIATION Spectrometer GSFC-11694 B74-10181 03 MOTION PICTURES Optical discriminator system LANGLEY-11580 B74-10139 03 MOTION STABILITY Suppression of bending motion in elastic bodies XAC-05632 B74-10070 06	deuterium pass-through structure LEWIS-11866 B74-10063 03 Method of measuring the thickness of radioactive thin films LEWIS-11971 B74-10065 03 A high yield neutron target LEWIS-12058 B74-10066 03 NICHROME (TRADEMARK) Plasma-sprayed metal-glass fluoride coatings for lubrication to 1170 K (1650 F) LEWIS-11930 B74-10016 04 NICKEL High strength, wire-reinforced electroformed structures LEWIS-12087 B74-10018 08 NICKEL ALLOYS A new nickel-base wrought superalloy for applications up to 1033 K (1400 F) LEWIS-11827 B74-10002 04 New nickel-base wrought superalloy with applications up to 1253 K (1800 F) LEWIS-11828 B74-10003 04
High voltage solid-state relay LEWIS-12096 B74-10006 01 Microelectronics packaging technique: A Concept MSC-19399 B74-10192 01 MICROMETEOROIDS Micrometeoroid velocity-and-trajectory analyzer GSFC-11889 B74-10286 01 Micrometeoroid composition analyzer GSFC-11892 B74-10287 01 MICROMINIATURIZATION Reduction of quantization error in measurement of frequency MSC-14649 B74-10191 02 MICROORGANISMS Micro-organism distribution sampling for bioassays LANGLEY-10789 B74-10289 05 MICROWAVE CIRCUITS High q band-pass resonators utilizing composite band-stop resonator pairs GSFC-10990 B74-10035 02	equipment ARC-10779 B74-10073 04 MOLDS Inexpensive lightweight mirror MSC-14615 B74-10155 05 MONITORS Microelectronics packaging technique: A Concept MSC-19399 B74-10192 01 Carbon monoxide detector M-FS-23090 B74-10268 04 Location of vehicles using AM station broadcasting signals NPO-13217 B74-10300 02 MONOCHROMATIC RADIATION Spectrometer GSFC-11694 B74-10181 03 MOTION PICTURES Optical discriminator system LANGLEY-11580 B74-10139 03 MOTION STABILITY Suppression of bending motion in elastic bodies XAC-05632 B74-10070 06	deuterium pass-through structure LEWIS-11866 B74-10063 03 Method of measuring the thickness of radioactive thin films LEWIS-11971 B74-10065 03 A high yield neutron target LEWIS-12058 B74-10066 03 NICHROME (TRADEMARK) Plasma-sprayed metal-glass fluoride coatings for lubrication to 1170 K (1650 F) LEWIS-11930 B74-10016 04 NICKEL High strength, wire-reinforced electroformed structures LEWIS-12087 B74-10018 08 NICKEL ALLOYS A new nickel-base wrought superalloy for applications up to 1033 K (1400 F) LEWIS-11827 B74-10002 04 New nickel-base wrought superalloy with applications up to 1253 K (1800 F) LEWIS-11828 B74-10003 04 Addition of silicon improves oxidation
High voltage solid-state relay LEWIS-12096 B74-10006 01 Microelectronics packaging technique: A Concept MSC-19399 B74-10192 01 MICROMETEOROIDS Micrometeoroid velocity-and-trajectory analyzer GSFC-11889 B74-10286 01 Micrometeoroid composition analyzer GSFC-11892 B74-10287 01 MICROMINIATURIZATION Reduction of quantization error in measurement of frequency MSC-14649 B74-10191 02 MICROORGANISMS Micro-organism distribution sampling for bioassays LANGLEY-10789 B74-10289 05 MICROWAVE CIRCUITS High q band-pass resonators utilizing composite band-stop resonator pairs GSFC-10990 B74-10035 02 MICROWAVE SENSORS	equipment ARC-10779 B74-10073 04 MOLDS Inexpensive lightweight mirror MSC-14615 B74-10155 05 MONITORS Microelectronics packaging technique: A Concept MSC-19399 B74-10192 01 Carbon monoxide detector M-FS-23090 B74-10268 04 Location of vehicles using AM station broadcasting signals NPO-13217 B74-10300 02 MONOCHROMATIC RADIATION Spectrometer GSEC-11694 B74-10181 03 MOTION PICTURES Optical discriminator system LANGLEY-11580 B74-10139 03 MOTION STABILITY Suppression of bending motion in elastic bodies XAC-05632 B74-10070 06 MOTORS Mechanical solar motor: A concept	deuterium pass-through structure LEWIS-11866 B74-10063 03 Method of measuring the thickness of radioactive thin films LEWIS-11971 B74-10065 03 A high yield neutron target LEWIS-12058 B74-10066 03 NICHROME (TRADEMARK) Plasma-sprayed metal-glass fluoride coatings for lubrication to 1170 K (1650 F) LEWIS-11930 B74-10016 04 NICKEL High strength wire-reinforced electroformed structures LEWIS-12087 B74-10018 08 NICKEL ALLOYS A new nickel-base wrought superalloy for applications up to 1033 K (1400 F) LEWIS-11827 B74-10002 04 New nickel-base wrought superalloy with applications up to 1253 K (1800 F) LEWIS-11828 B74-10003 04 Addition of silicon improves oxidation resistance of nickel based superalloys
High voltage solid-state relay LEWIS-12096 B74-10006 01 Microelectronics packaging technique: A Concept MSC-19399 B74-10192 01 MICROMETEOROIDS Micrometeoroid velocity-and-trajectory analyzer GSFC-11889 B74-10286 01 Micrometeoroid composition analyzer GSFC-11892 B74-10287 01 MICROMINIATURIZATION Reduction of quantization error in measurement of frequency MSC-14649 B74-10191 02 MICROORGANISMS Micro-organism distribution sampling for bioassays LANGLEY-10789 B74-10289 05 MICROWAVE CIRCUITS High q band-pass resonators utilizing composite band-stop resonator pairs GSFC-10990 B74-10035 02	equipment ARC-10779 B74-10073 04 MOLDS Inexpensive lightweight mirror MSC-14615 B74-10155 05 MONITORS Microelectronics packaging technique: A Concept MSC-19399 B74-10192 01 Carbon monoxide detector M-FS-23090 B74-10268 04 Location of vehicles using AM station broadcasting signals NPO-13217 B74-10300 02 MONOCHROMATIC RADIATION Spectrometer GSFC-11694 B74-10181 03 MOTION PICTURES Optical discriminator system LANGLEY-11580 B74-10139 03 MOTION STABILITY Suppression of bending motion in elastic bodies XAC-05632 B74-10070 06 MOTORS Mechanical solar motor: A concept M-FS-23062 B74-10292 07	deuterium pass-through structure LEWIS-11866 B74-10063 03 Method of measuring the thickness of radioactive thin films LEWIS-11971 B74-10065 03 A high yield neutron target LEWIS-12058 B74-10066 03 NICHROME (TRADEMARK) Plasma-sprayed metal-glass fluoride coatings for lubrication to 1170 K (1650 F) LEWIS-11930 B74-10016 04 NICKEL High strength wire-reinforced electroformed structures LEWIS-12087 B74-10018 08 NICKEL ALLOYS A new nickel-base wrought superalloy for applications up to 1033 K (1400 F) LEWIS-11827 B74-10002 04 New nickel-base wrought superalloy with applications up to 1253 K (1800 F) LEWIS-11828 B74-10003 04 Addition of silicon improves oxidation resistance of nickel based superalloys LEWIS-12138 B74-10007 04
High voltage solid-state relay LEWIS-12096 B74-10006 01 Microelectronics packaging technique: A Concept MSC-19399 B74-10192 01 MICROMETEOROIDS Micrometeoroid velocity-and-trajectory analyzer GSFC-11889 B74-10286 01 Micrometeoroid composition analyzer GSFC-11892 B74-10287 01 MICROMINIATURIZATION Reduction of quantization error in measurement of frequency MSC-14649 B74-10191 02 MICROORGANISMS Micro-organism distribution sampling for bioassays LANGLEY-10789 B74-10289 05 MICROWAVE CIRCUITS High q band-pass resonators utilizing composite band-stop resonator pairs GSFC-10990 B74-10035 02 MICROWAVE SENSORS Pocket-size microwave radiation hazard	equipment ARC-10779 B74-10073 04 MOLDS Inexpensive lightweight mirror MSC-14615 B74-10155 05 MONITORS Microelectronics packaging technique: A Concept MSC-19399 B74-10192 01 Carbon monoxide detector M-FS-23090 B74-10268 04 Location of vehicles using AM station broadcasting signals NPO-13217 B74-10300 02 MONOCHROMATIC RADIATION Spectrometer GSEC-11694 B74-10181 03 MOTION PICTURES Optical discriminator system LANGLEY-11580 B74-10139 03 MOTION STABILITY Suppression of bending motion in elastic bodies XAC-05632 B74-10070 06 MOTORS Mechanical solar motor: A concept	deuterium pass-through structure LEWIS-11866 B74-10063 03 Method of measuring the thickness of radioactive thin films LEWIS-11971 B74-10065 03 A high yield neutron target LEWIS-12058 B74-10066 03 NICHROME (TRADEMARK) Plasma-sprayed metal-glass fluoride coatings for lubrication to 1170 K (1650 F) LEWIS-11930 B74-10016 04 NICKEL High strength, wire-reinforced electroformed structures LEWIS-12087 B74-10018 08 NICKEL ALLOYS A new nickel-base wrought superalloy for applications up to 1033 K (1400 F) LEWIS-11827 B74-10002 04 New nickel-base wrought superalloy with applications up to 1253 K (1800 F) LEWIS-11828 B74-10003 04 Addition of silicon improves oxidation resistance of nickel based superalloys LEWIS-12138 B74-10007 04 High strength nickel base alloy, WAZ-16, for applications up to 2200 F
MICROELECTRONICS High voltage solid-state relay LEWIS-12096 B74-10006 01 Microelectronics packaging technique: A Concept MSC-19399 B74-10192 01 MICROMETEOROIDS Micrometeoroid velocity-and-trajectory analyzer GSFC-11889 B74-10286 01 Micrometeoroid composition analyzer GSFC-11892 B74-10287 01 MICROMINIATURIZATION Reduction of quantization error in measurement of frequency MSC-14649 B74-10191 02 MICROORGANISMS Micro-organism distribution sampling for bioassays LANGLEY-10789 B74-10289 05 MICROWAVE CIRCUITS High q band-pass resonators utilizing composite band-stop resonator pairs GSFC-10990 B74-10035 02 MICROWAVE SENSORS Pocket-size microwave radiation hazard detector	equipment ARC-10779 B74-10073 04 MOLDS Inexpensive lightweight mirror MSC-14615 B74-10155 05 MONITORS Microelectronics packaging technique: A Concept MSC-19399 B74-10192 01 Carbon monoxide detector M-FS-23090 B74-10268 04 Location of vehicles using AM station broadcasting signals NPO-13217 B74-10300 02 MONOCHROMATIC RADIATION Spectrometer GSFC-11694 B74-10181 03 MOTION PICTURES Optical discriminator system LANGLEY-11580 B74-10139 03 MOTION STABILITY Suppression of bending motion in elastic bodies XAC-05632 B74-10070 06 MOTORS Mechanical solar motor: A concept M-FS-23062 B74-10292 07 MUFFLERS Noise suppressor LANGLEY-11141 B74-10261 03	deuterium pass-through structure LEWIS-11866 B74-10063 03 Method of measuring the thickness of radioactive thin films LEWIS-11971 B74-10065 03 A high yield neutron target LEWIS-12058 B74-10066 03 NICHROME (TRADEMARK) Plasma-sprayed metal-glass fluoride coatings for lubrication to 1170 K (1650 F) LEWIS-11930 B74-10016 04 NICKEL High strength wire-reinforced electroformed structures LEWIS-12087 B74-10018 08 NICKEL ALLOYS A new nickel-base wrought superalloy for applications up to 1033 K (1400 F) LEWIS-11827 B74-10002 04 New nickel-base wrought superalloy with applications up to 1253 K (1800 F) LEWIS-11828 B74-10003 04 Addition of silicon improves oxidation resistance of nickel based superalloys LEWIS-12138 B74-10007 04 High strength nickel base alloy, WAZ-16, for applications up to 2200 F LEWIS-12270 B74-10082 04
High voltage solid-state relay LEWIS-12096 B74-10006 01 Microelectronics packaging technique: A Concept MSC-19399 B74-10192 01 MICROMETEOROIDS Micrometeoroid velocity-and-trajectory analyzer GSFC-11889 B74-10286 01 Micrometeoroid composition analyzer GSFC-11892 B74-10287 01 MICROMINIATURIZATION Reduction of quantization error in measurement of frequency MSC-14649 B74-10191 02 MICROORGANISMS Micro-organism distribution sampling for bioassays LANGLEY-10789 B74-10289 05 MICROWAVE CIRCUITS High q band-pass resonators utilizing composite band-stop resonator pairs GSFC-10990 B74-10035 02 MICROWAVE SENSORS Pocket-size microwave radiation hazard detector NPO-11461 B74-10097 02 MINIATURE ELECTRONIC EQUIPMENT Integrated structure vacuum tube: A	equipment ARC-10779 B74-10073 04 MOLDS Inexpensive lightweight mirror MSC-14615 B74-10155 05 MONITORS Microelectronics packaging technique: A Concept MSC-19399 B74-10192 01 Carbon monoxide detector M-FS-23090 B74-10268 04 Location of vehicles using AM station broadcasting signals NP0-13217 B74-10300 02 MONOCHROMATIC RADIATION Spectrometer GSFC-11694 B74-10181 03 MOTION PICTURES Optical discriminator system LANGLEY-11580 B74-10139 03 MOTION STABILITY Suppression of bending motion in elastic bodies XAC-05632 B74-10070 06 MOTORS Mechanical solar motor: A concept M-FS-23062 B74-10292 07 MUFFLERS Noise suppressor LANGLEY-11141 B74-10261 03 MULTIPATH TRANSMISSION	deuterium pass-through structure LEWIS-11866 B74-10063 03 Method of measuring the thickness of radioactive thin films LEWIS-11971 B74-10065 03 A high yield neutron target LEWIS-12058 B74-10066 03 NICHROME (TRADEMARK) Plasma-sprayed metal-glass fluoride coatings for lubrication to 1170 K (1650 F) LEWIS-11930 B74-10016 04 NICKEL High strength, wire-reinforced electroformed structures LEWIS-12087 B74-10018 08 NICKEL ALLOYS A new nickel-base wrought superalloy for applications up to 1033 K (1400 F) LEWIS-11827 B74-10002 04 New nickel-base wrought superalloy with applications up to 1253 K (1800 F) LEWIS-11828 B74-10003 04 Addition of silicon improves oxidation resistance of nickel based superalloys LEWIS-12138 B74-10007 04 High strength nickel base alloy, WAZ-16, for applications up to 2200 F LEWIS-12270 B74-10082 04 Advanced tungsten fiber-reinforced nickel
High voltage solid-state relay LEWIS-12096 B74-10006 01 Microelectronics packaging technique: A Concept MSC-19399 B74-10192 01 MICROMETEOROIDS Micrometeoroid velocity-and-trajectory analyzer GSFC-11889 B74-10286 01 Micrometeoroid composition analyzer GSFC-11892 B74-10287 01 MICROMINIATURIZATION Reduction of quantization error in measurement of frequency MSC-14649 B74-10191 02 MICROORGANISMS Micro-organism distribution sampling for bioassays LANGLEY-10789 B74-10289 05 MICROWAVE CIRCUITS High q band-pass resonators utilizing composite band-stop resonator pairs GSFC-10990 B74-10035 02 MICROWAVE SENSORS Pocket-size microwave radiation hazard detector NPO-11461 B74-10097 02 MINIATURE ELECTRONIC EQUIPMENT	equipment ARC-10779 B74-10073 04 MOLDS Inexpensive lightweight mirror MSC-14615 B74-10155 05 MONITORS Microelectronics packaging technique: A Concept MSC-19399 B74-10192 01 Carbon monoxide detector M-FS-23090 B74-10268 04 Location of vehicles using AM station broadcasting signals NPO-13217 B74-10300 02 MONOCHROMATIC RADIATION Spectrometer GSFC-11694 B74-10181 03 MOTION PICTURES Optical discriminator system LANGLEY-11580 B74-10139 03 MOTION STABILITY Suppression of bending motion in elastic bodies XAC-05632 B74-10070 06 MOTORS Mechanical solar motor: A concept M-FS-23062 B74-10292 07 MUFFLERS Noise suppressor LANGLEY-11141 B74-10261 03	deuterium pass-through structure LEWIS-11866 B74-10063 03 Method of measuring the thickness of radioactive thin films LEWIS-11971 B74-10065 03 A high yield neutron target LEWIS-12058 B74-10066 03 NICHROME (TRADEMARK) Plasma-sprayed metal-glass fluoride coatings for lubrication to 1170 K (1650 F) LEWIS-11930 B74-10016 04 NICKEL High strength wire-reinforced electroformed structures LEWIS-12087 B74-10018 08 NICKEL ALLOYS A new nickel-base wrought superalloy for applications up to 1033 K (1400 F) LEWIS-11827 B74-10002 04 New nickel-base wrought superalloy with applications up to 1253 K (1800 F) LEWIS-11828 B74-10003 04 Addition of silicon improves oxidation resistance of nickel based superalloys LEWIS-12138 B74-10007 04 High strength nickel base alloy, WAZ-16, for applications up to 2200 F LEWIS-12270 B74-10082 04

NICKEL STEELS	Ο	ORTHOTROPIC SHELLS
High-strength alloy with resistance to hydrogen-environment embrittlement		Computer program for structural analysis of layered orthotropic ring-stiffened shells
M-FS-19234 B74-10265 04	O RING SEALS Improved circumferential shaft seal	of revolution (SALORS): Linear stress
NIMBUS SATELLITES	LEWIS-11873 B74-10062 07	analysis option
Computer program for spacecraft-booster separation spring selection, set	OIL EXPLORATION	LANGLEY-11569 B74-10186 09 OSCILLATION DAMPERS
composition, and location determination GSFC-11616 B74-10037 09	Improved dispensing targets for ion beam particle generators	Swashplate feedback control for tilt-rotor aircraft
NIOBIUM ALLOYS	NPO-13112 B74-10108 03	ARC-10854 B74-10174 06
Rapid method for determining nitrogen	OPTICAL COMMUNICATION Dualiv-mode-locked ND: YAG laser	OSCILLATORS
in tantalum and niobium alloys LEWIS-12237 B74-10085 04	GSFC-11746 B74-10038 03	Minicomputer-controlled frequency generator
NITROGEN	Dynamic polarization compensating	NPO-11962 B74-10163 02
Rapid method for determining nitrogen	system for optical communications receiver	OSMOSIS
in tantalum and niobium alloys LEWIS-12237 B74-10085 04	GSFC-11782 B74-10182 03	Domestic wash water reclamation LANGLEY-11606 B74-10177 04
NOISE REDUCTION	Optical communication channel simulator	OXIDATION
Minicomputer-controlled frequency	system GSFC-11877 B74-10258 01	In-process oxidation protection in fluxless
generator NPO-11962 B74-10163 02	OPTICAL DATA PROCESSING	brazing or diffusion bonding of aluminum alloys
Noise suppressor	Recorder/processor apparatus	MSC-14435 B74-10096 04
LANGLEY-11141 B74-10261 03	GSFC-11553 B74-10042 03	OXIDATION RESISTANCE
NONDESTRUCTIVE TESTS	OPTICAL EQUIPMENT	Addition of silicon improves oxidation resistance of nickel based superalloys
Detection of cracks in surface insulation	Inexpensive lightweight mirror MSC-14615 B74-10155 05	LEWIS-12138 B74-10007 04
MSC-14187 B74-10095 04	OPTICAL MEASUREMENT	Plasma-sprayed metal-glass fluoride
Valve degradation detector ARC-10850 B74-10117 03	Wavelength-selective, sequential Q-	coatings for lubrication to 1170 K (1650 F)
Surface roughness measured by optical	switching laser cavity LANGLEY-11045 B74-10134 03	LEWIS-11930 B74-10016 04
signatures	OPTICAL REFLECTION	OXYGEN
ARC-10853 B74-10118 03	Surface roughness measured by optical	Lead-oxygen closed-loop battery system M-FS-23059 B74-10267 06
Guidebook of nondestructive evaluation techniques for materials and structures	signatures ARC-10853 B74-10118 03	OXYGEN PRODUCTION
LEWIS-12272 B74-10122 04	OPTICAL SCANNERS	Spacecraft oxygen recovery system
Holographic evaluation of fatigue cracks	Laser-scanning techniques for rapid	ARC-10868 B74-10220 05
by a compressive stress (HYSTERESIS) technique	ballistics identification	
by a compressive stress (HYSTERESIS) technique MSC-14555 B74-10156 06	NPO-11861 B74-10102 03	Р
technique MSC-14555 B74-10156 06 System for measuring transients in fluid		•
technique MSC-14555 B74-10156 06	NPO-11861 B74-10102 03 Fast signal averager ARC-10090 B74-10109 02 OPTICAL TRACKING	P-TYPE SEMICONDUCTORS
technique MSC-14555 B74-10156 06 System for measuring transients in fluid flow ARC-10852 B74-10217 03 Compact source of soft X-rays	NPO-11861 B74-10102 03 Fast signal averager ARC-10090 B74-10109 02 OPTICAL TRACKING Remote sunfall monitor: A concept	P-TYPE SEMICONDUCTORS Efficiency increased in new solar cell: A Concept
technique MSC-14555 B74-10156 06 System for measuring transients in fluid flow ARC-10852 B74-10217 03 Compact source of soft X-rays HQ-10732 B74-10232 03	NPO-11861 B74-10102 03 Fast signal averager ARC-10090 B74-10109 02 OPTICAL TRACKING Remote sunfall monitor: A concept M-FS-22943 B74-10149 03	P-TYPE SEMICONDUCTORS Efficiency increased in new solar cell: A Concept LANGLEY-11174 B74-10090 01
technique MSC-14555 B74-10156 06 System for measuring transients in fluid flow ARC-10852 B74-10217 03 Compact source of soft X-rays	NPO-11861	P-TYPE SEMICONDUCTORS Efficiency increased in new solar cell: A Concept
technique MSC-14555 B74-10156 06 System for measuring transients in fluid flow ARC-10852 B74-10217 03 Compact source of soft X-rays HQ-10732 B74-10232 03 Nondestructive testing of railroad wheels and rails by ultrasonics M-FS-23086 B74-10238 06	NPO-11861 B74-10102 03 Fast signal averager ARC-10090 B74-10109 02 OPTICAL TRACKING Remote sunfall monitor: A concept M-FS-22943 B74-10149 03 ORGANIC COMPOUNDS Detection of cracks in surface insulation	P-TYPE SEMICONDUCTORS Efficiency increased in new solar cell: A Concept LANGLEY-11174 B74-10090 01 PACKAGING Toroidal equipment packaging ARC-10828 B74-10055 03
technique MSC-14555 B74-10156 06 System for measuring transients in fluid flow ARC-10852 B74-10217 03 Compact source of soft X-rays HQ-10732 Nondestructive testing of railroad wheels and rails by ultrasonics M-FS-23086 B74-10238 06 Strain gauge sensitivity improved by	NPO-11861 B74-10102 03	P-TYPE SEMICONDUCTORS Efficiency increased in new solar cell: A Concept LANGLEY-11174 B74-10090 01 PACKAGING Toroidal equipment packaging ARC-10828 B74-10055 03 PACKING
technique MSC-14555 B74-10156 06 System for measuring transients in fluid flow ARC-10852 B74-10217 03 Compact source of soft X-rays HQ-10732 B74-10232 03 Nondestructive testing of railroad wheels and rails by ultrasonics M-FS-23086 B74-10238 06	NPO-11861 B74-10102 03 Fast signal averager ARC-10090 B74-10109 02 OPTICAL TRACKING Remote sunfall monitor: A concept M-FS-22943 B74-10149 03 ORGANIC COMPOUNDS Detection of cracks in surface insulation MSC-14187 B74-10095 04 ORGANIC MATERIALS Polymer compositions suitable for use	P-TYPE SEMICONDUCTORS Efficiency increased in new solar cell: A Concept LANGLEY-11174 B74-10090 01 PACKAGING Toroidal equipment packaging ARC-10828 B74-10055 03 PACKING Color-coded area sensitivity maps of photomultipliers
technique MSC-14555 B74-10156 06 System for measuring transients in fluid flow ARC-10852 B74-10217 03 Compact source of soft X-rays H0-10732 B74-10232 03 Nondestructive testing of railroad wheels and rails by ultrasonics M-FS-23086 Strain gauge sensitivity improved by using a composite beam NPO-13170 B74-10297 07 NOZZLE FLOW	NPO-11861 B74-10102 03 Fast signal averager ARC-10090 B74-10109 02 OPTICAL TRACKING Remote sunfall monitor: A concept M-FS-22943 B74-10149 03 ORGANIC COMPOUNDS Detection of cracks in surface insulation MSC-14187 B74-10095 04 ORGANIC MATERIALS Polymer compositions suitable for use in enriched oxygen atmospheres	P-TYPE SEMICONDUCTORS Efficiency increased in new solar cell: A Concept LANGLEY-11174 B74-10090 01 PACKAGING Toroidal equipment packaging ARC-10828 B74-10055 03 PACKING Color-coded area sensitivity maps of photomultipliers LANGLEY-10320 B74-10259 01
technique MSC-14555 B74-10156 06 System for measuring transients in fluid flow ARC-10852 B74-10217 03 Compact source of soft X-rays HQ-10732 B74-10232 03 Nondestructive testing of railroad wheels and rails by ultrasonics M-FS-23086 B74-10238 06 Strain gauge sensitivity improved by using a composite beam NPO-13170 B74-10297 07 NOZZLE FLOW Numerical program for analysis of	RPO-11861 B74-10102 03 Fast signal averager ARC-10090 B74-10109 02 OPTICAL TRACKING Remote sunfall monitor: A concept M-FS-22943 B74-10149 03 ORGANIC COMPOUNDS Detection of cracks in surface insulation MSC-14187 B74-10095 04 ORGANIC MATERIALS Polymer compositions suitable for use in enriched oxygen atmospheres MSC-14618 B74-10154 04	P-TYPE SEMICONDUCTORS Efficiency increased in new solar cell: A Concept LANGLEY-11174 B74-10090 01 PACKAGING Toroidal equipment packaging ARC-10828 B74-10055 03 PACKING Color-coded area sensitivity maps of photomultipliers LANGLEY-10320 B74-10259 01
technique MSC-14555 B74-10156 06 System for measuring transients in fluid flow ARC-10852 B74-10217 03 Compact source of soft X-rays HQ-10732 B74-10232 03 Nondestructive testing of railroad wheels and rails by ultrasonics M-FS-23086 Strain gauge sensitivity improved by using a composite beam NPO-13170 B74-10297 07 NOZZLE FLOW Numerical program for analysis of three-dimensional supersonic exhaust flow fields (CHAR 3D)	RPO-11861 B74-10102 03 Fast signal averager ARC-10090 B74-10109 02 OPTICAL TRACKING Remote sunfall monitor: A concept M-FS-22943 B74-10149 03 ORGANIC COMPOUNDS Detection of cracks in surface insulation MSC-14187 B74-10095 04 ORGANIC MATERIALS Polymer compositions suitable for use in enriched oxygen atmospheres MSC-14618 B74-10154 04 New tooth enamel from brushite crystals	P-TYPE SEMICONDUCTORS Efficiency increased in new solar cell: A Concept LANGLEY-11174 B74-10090 01 PACKAGING Toroidal equipment packaging ARC-10828 B74-10055 03 PACKING Color-coded area sensitivity maps of photomultipliers LANGLEY-10320 B74-10259 01 PANELS Laminating cored, stressed-face, sandwich structures
technique MSC-14555 B74-10156 06 System for measuring transients in fluid flow ARC-10852 B74-10217 03 Compact source of soft X-rays HQ-10732 B74-10232 03 Nondestructive testing of railroad wheels and rails by ultrasonics M-FS-23086 Strain gauge sensitivity improved by using a composite beam NPO-13170 B74-10297 07 NOZZLE FLOW Numerical program for analysis of three-dimensional supersonic exhaust flow fields (CHAR 3D) LANGLEY-11596 B74-10236 09	RPO-11861 B74-10102 03 Fast signal averager ARC-10090 B74-10109 02 OPTICAL TRACKING Remote sunfall monitor: A concept B74-10149 03 ORGANIC COMPOUNDS Detection of cracks in surface insulation MSC-14187 B74-10095 04 ORGANIC MATERIALS Polymer compositions suitable for use in enriched oxygen atmospheres MSC-14618 B74-10154 04 New tooth enamel from brushite crystals ERC-10338 B74-10199 05	P-TYPE SEMICONDUCTORS Efficiency increased in new solar cell: A Concept LANGLEY-11174 B74-10090 01 PACKAGING Toroidal equipment packaging ARC-10828 B74-10055 03 PACKING Color-coded area sensitivity maps of photomultipliers LANGLEY-10320 B74-10259 01 PANELS Laminating cored, stressed-face, sandwich structures XLA-11028 B74-10233 06
technique MSC-14555 B74-10156 06 System for measuring transients in fluid flow ARC-10852 B74-10217 03 Compact source of soft X-rays HQ-10732 B74-10232 03 Nondestructive testing of railroad wheels and rails by ultrasonics M-FS-23086 Strain gauge sensitivity improved by using a composite beam NPO-13170 B74-10297 07 NOZZLE FLOW Numerical program for analysis of three-dimensional supersonic exhaust flow fields (CHAR 3D)	RPO-11861 B74-10102 03 Fast signal averager ARC-10090 B74-10109 02 OPTICAL TRACKING Remote sunfall monitor: A concept M-FS-22943 B74-10149 03 ORGANIC COMPOUNDS Detection of cracks in surface insulation MSC-14187 B74-10095 04 ORGANIC MATERIALS Polymer compositions suitable for use in enriched oxygen atmospheres MSC-14618 B74-10154 04 New tooth enamel from brushite crystals ERC-10338 B74-10199 05 ORGANIC NITRATES	P-TYPE SEMICONDUCTORS Efficiency increased in new solar cell: A Concept LANGLEY-11174 B74-10090 01 PACKAGING Toroidal equipment packaging ARC-10828 B74-10055 03 PACKING Color-coded area sensitivity maps of photomultipliers LANGLEY-10320 B74-10259 01 PANELS Laminating cored, stressed-face, sandwich structures XLA-11028 B74-10233 06 New insulation attachment method eliminates compatibility bondline stresses
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technique MSC-14555 B74-10156 06 System for measuring transients in fluid flow ARC-10852 B74-10217 03 Compact source of soft X-rays HQ-10732 B74-10232 03 Nondestructive testing of railroad wheels and rails by ultrasonics M-FS-23086 B74-10238 06 Strain gauge sensitivity improved by using a composite beam NPO-13170 B74-10297 07 NOZZLE FLOW Numerical program for analysis of three-dimensional supersonic exhaust flow fields (CHAR 3D) LANGLEY-11596 B74-10236 09 NOZZLE GEOMETRY Vented vectoring-nozzle for STOL and V/STOL aircraft ARC-10839 B74-10058 06	RPO-11861 B74-10102 03 Fast signal averager ARC-10090 B74-10109 02 OPTICAL TRACKING Remote sunfall monitor: A concept B74-10149 03 ORGANIC COMPOUNDS Detection of cracks in surface insulation MSC-14187 B74-10095 04 ORGANIC MATERIALS Polymer compositions suitable for use in enriched oxygen atmospheres MSC-14618 B74-10154 04 New tooth enamel from brushite crystals ERC-10338 B74-10199 05 ORGANIC NITRATES Negative ion spectrometry for detecting nitrated explosives NPO-13082 B74-10276 02	P-TYPE SEMICONDUCTORS Efficiency increased in new solar cell: A Concept LANGLEY-11174 B74-10090 01 PACKAGING Toroidal equipment packaging ARC-10828 B74-10055 03 PACKING Color-coded area sensitivity maps of photomultipliers LANGLEY-10320 B74-10259 01 PANELS Laminating cored, stressed-face, sandwich structures XLA-11028 B74-10233 06 New insulation attachment method eliminates compatibility bondline stresses
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technique MSC-14555 B74-10156 06 System for measuring transients in fluid flow ARC-10852 B74-10217 03 Compact source of soft X-rays HQ-10732 B74-10232 03 Nondestructive testing of railroad wheels and rails by ultrasonics M-F5-23086 B74-10238 06 Strain gauge sensitivity improved by using a composite beam NPO-13170 B74-10297 07 NOZZLE FLOW Numerical program for analysis of three-dimensional supersonic exhaust flow fields (CHAR 3D) LANGLEY-11596 B74-10236 09 NOZZLE GEOMETRY Vented vectoring-nozzle for STOL and V/STOL aircraft ARC-10839 B74-10058 06 NOZZLE THRUST COEFFICIENTS Vented vectoring-nozzle for STOL and V/STOL aircraft	RPO-11861 B74-10102 03 Fast signal averager ARC-10090 B74-10109 02 OPTICAL TRACKING Remote sunfall monitor: A concept B74-10149 03 ORGANIC COMPOUNDS Detection of cracks in surface insulation MSC-14187 B74-10095 04 ORGANIC MATERIALS Polymer compositions suitable for use in enriched oxygen atmospheres MSC-14618 B74-10154 04 New tooth enamel from brushite crystals ERC-10338 B74-10199 05 ORGANIC NITRATES Negative ion spectrometry for detecting nitrated explosives NPO-13082 B74-10276 02	P-TYPE SEMICONDUCTORS Efficiency increased in new solar cell: A Concept LANGLEY-11174 B74-10090 01 PACKAGING Toroidal equipment packaging ARC-10828 B74-10055 03 PACKING Color-coded area sensitivity maps of photomultipliers LANGLEY-10320 B74-10259 01 PANELS Laminating cored, stressed-face, sandwich structures XLA-11028 B74-10233 06 New insulation attachment method eliminates compatibility bondline stresses MSC-12615 B74-10269 07 PAPERS Polyelectrolytes with high charge density NPO-11918 B74-10159 04
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technique MSC-14555 B74-10156 06 System for measuring transients in fluid flow ARC-10852 B74-10217 03 Compact source of soft X-rays HQ-10732 B74-10232 03 Nondestructive testing of railroad wheels and rails by ultrasonics M-FS-23086 Strain gauge sensitivity improved by using a composite beam NPO-13170 B74-10237 NOZZLE FLOW Numerical program for analysis of three-dimensional supersonic exhaust flow fields (CHAR 3D) LANGLEY-11596 B74-10236 09 NOZZLE GEOMETRY Vented vectoring-nozzle for STOL and V/STOL aircraft ARC-10839 B74-10058 06 NOZZLE THRUST COEFFICIENTS Vented vectoring-nozzle for STOL and V/STOL aircraft ARC-10839 B74-10058 06 NUCLEAR AUXILIARY Radioisotope heater ARC-10791 B74-10051 03	Fast signal averager ARC-10090 PTICAL TRACKING Remote sunfall monitor: A concept M-FS-22943 CORGANIC COMPOUNDS Detection of cracks in surface insulation MSC-14187 Polymer compositions suitable for use in enriched oxygen atmospheres MSC-14618 New tooth enamel from brushite crystals ERC-10338 B74-10199 CORGANIC NITRATES Negative ion spectrometry for detecting nitrated explosives NPO-13082 CORIENTATION Spacecraft attitude determination by fanscan technique ARC-10827 B74-10198 B74-10198 B74-10198 D2	P-TYPE SEMICONDUCTORS Efficiency increased in new solar cell: A Concept LANGLEY-11174 B74-10090 01 PACKAGING Toroidal equipment packaging ARC-10828 B74-10055 03 PACKING Color-coded area sensitivity maps of photomultipliers LANGLEY-10320 B74-10259 01 PANELS Laminating cored, stressed-face, sandwich structures XLA-11028 B74-10233 06 New insulation attachment method eliminates compatibility bondline stresses MSC-12615 B74-10269 07 PAPERS Polyelectrolytes with high charge density NPO-11918 B74-10159 04 Inspection of transparent surfaces using photosensitive paper
technique MSC-14555 B74-10156 06 System for measuring transients in fluid flow ARC-10852 Compact source of soft X-rays HQ-10732 R74-10232 03 Nondestructive testing of railroad wheels and rails by ultrasonics M-F5-23086 Strain gauge sensitivity improved by using a composite beam NPO-13170 R74-10237 NOZZLE FLOW Numerical program for analysis of three-dimensional supersonic exhaust flow fields (CHAR 3D) LANGLEY-11596 R74-10236 09 NOZZLE GEOMETRY Vented vectoring-nozzle for STOL and V/STOL aircraft ARC-10839 R74-10058 06 NOZZLE THRUST COEFFICIENTS Vented vectoring-nozzle for STOL and V/STOL aircraft ARC-10839 R74-10058 06 NUCLEAR AUXILIARY Radioisotope heater ARC-10791 B74-10051 03 Economical technique for fragmentation testing	Fast signal averager ARC-10090 PTICAL TRACKING Remote sunfall monitor: A concept B74-10149 03 ORGANIC COMPOUNDS Detection of cracks in surface insulation MSC-14187 Polymer compositions suitable for use in enriched oxygen atmospheres MSC-14618 New tooth enamel from brushite crystals ERC-10338 B74-10199 05 ORGANIC NITRATES Negative ion spectrometry for detecting nitrated explosives NPO-13082 ORIENTATION Spacecraft attitude determination by fanscan technique ARC-10827 ORTHOPEDICS Therapeutic hand-exercising device with	P-TYPE SEMICONDUCTORS Efficiency increased in new solar cell: A Concept LANGLEY-11174 B74-10090 01 PACKAGING Toroidal equipment packaging ARC-10828 B74-10055 03 PACKING Color-coded area sensitivity maps of photomultipliers LANGLEY-10320 B74-10259 01 PANELS Laminating cored, stressed-face, sandwich structures XLA-11028 B74-10233 06 New insulation attachment method eliminates compatibility bondline stresses MSC-12615 B74-10269 07 PAPERS Polyelectrolytes with high charge density NPO-11918 B74-10159 04 Inspection of transparent surfaces using photosensitive paper MSC-19442 B74-10024 03 PARABOLIC ANTENNAS Variable-beamwidth antennas GSFC-11760 B74-10041 02
technique MSC-14555 B74-10156 06 System for measuring transients in fluid flow ARC-10852 B74-10217 03 Compact source of soft X-rays HQ-10732 B74-10232 03 Nondestructive testing of railroad wheels and rails by ultrasonics M-FS-23086 B74-10238 06 Strain gauge sensitivity improved by using a composite beam NPO-13170 B74-10297 07 NOZZLE FLOW Numerical program for analysis of three-dimensional supersonic exhaust flow fields (CHAR 3D) LANGLEY-11596 B74-10236 09 NOZZLE GEOMETRY Vented vectoring-nozzle for STOL and V/STOL aircraft ARC-10839 B74-10058 06 NOZZLE THRUST COEFFICIENTS Vented vectoring-nozzle for STOL and V/STOL aircraft ARC-10839 B74-10058 06 NUCLEAR AUXILIARY Radioisotope heater ARC-10791 B74-10051 03 Economical technique for fragmentation testing ARC-10792 B74-10052 04	Fast signal averager ARC-10090 Fast signal averager ARC-10090 OPTICAL TRACKING Remote sunfall monitor: A concept M-FS-22943 ORGANIC COMPOUNDS Detection of cracks in surface insulation MSC-14187 ORGANIC MATERIALS Polymer compositions suitable for use in enriched oxygen atmospheres MSC-14618 New tooth enamel from brushite crystals ERC-10338 B74-10199 ORGANIC NITRATES Negative ion spectrometry for detecting nitrated explosives NPO-13082 ORIENTATION Spacecraft attitude determination by fanscan technique ARC-10827 ORTHOPEDICS Therapeutic hand-exercising device with cycling pressure value LANGLEY-11579 B74-10140 B74-10140 B74-10198	P-TYPE SEMICONDUCTORS Efficiency increased in new solar cell: A Concept LANGLEY-11174 B74-10090 01 PACKAGING Toroidal equipment packaging ARC-10828 B74-10055 03 PACKING Color-coded area sensitivity maps of photomultipliers LANGLEY-10320 B74-10259 01 PANELS Laminating cored, stressed-face, sandwich structures XLA-11028 B74-10233 06 New insulation attachment method eliminates compatibility bondline stresses MSC-12615 B74-10269 07 PAPERS Polyelectrolytes with high charge density NPO-11918 B74-10159 04 Inspection of transparent surfaces using photosensitive paper MSC-19442 B74-10224 03 PARABOLIC ANTENNAS Variable-beamwidth antennas GSFC-11760 B74-10041 02 Bidirectional zoom antenna
technique MSC-14555 B74-10156 06 System for measuring transients in fluid flow ARC-10852 Compact source of soft X-rays HQ-10732 R74-10232 03 Nondestructive testing of railroad wheels and rails by ultrasonics M-F5-23086 Strain gauge sensitivity improved by using a composite beam NPO-13170 R74-10237 NOZZLE FLOW Numerical program for analysis of three-dimensional supersonic exhaust flow fields (CHAR 3D) LANGLEY-11596 R74-10236 09 NOZZLE GEOMETRY Vented vectoring-nozzle for STOL and V/STOL aircraft ARC-10839 R74-10058 06 NOZZLE THRUST COEFFICIENTS Vented vectoring-nozzle for STOL and V/STOL aircraft ARC-10839 R74-10058 06 NUCLEAR AUXILIARY Radioisotope heater ARC-10791 B74-10051 03 Economical technique for fragmentation testing	Fast signal averager ARC-10090 PTICAL TRACKING Remote sunfall monitor: A concept B74-10149 03 ORGANIC COMPOUNDS Detection of cracks in surface insulation MSC-14187 Polymer compositions suitable for use in enriched oxygen atmospheres MSC-14618 Remote to a monitor: A concept B74-10199 05 ORGANIC COMPOUNDS Detection of cracks in surface insulation MSC-14187 Polymer compositions suitable for use in enriched oxygen atmospheres MSC-14618 Remote to a monitor of tracks in surface	P-TYPE SEMICONDUCTORS Efficiency increased in new solar cell: A Concept LANGLEY-11174 B74-10090 01 PACKAGING Toroidal equipment packaging ARC-10828 B74-10055 03 PACKING Color-coded area sensitivity maps of photomultipliers LANGLEY-10320 B74-10259 01 PANELS Laminating cored, stressed-face, sandwich structures XLA-11028 B74-10233 06 New insulation attachment method eliminates compatibility bondline stresses MSC-12615 B74-10269 07 PAPERS Polyelectrolytes with high charge density NPO-11918 B74-10159 04 Inspection of transparent surfaces using photosensitive paper MSC-19442 B74-10024 03 PARABOLIC ANTENNAS Variable-beamwidth antennas GSFC-11760 B74-10041 02
technique MSC-14555 B74-10156 06 System for measuring transients in fluid flow ARC-10852 B74-10217 03 Compact source of soft X-rays HQ-10732 B74-10232 03 Nondestructive testing of railroad wheels and rails by ultrasonics M-FS-23086 B74-10238 06 Strain gauge sensitivity improved by using a composite beam NPO-13170 B74-10297 07 NOZZLE FLOW Numerical program for analysis of three-dimensional supersonic exhaust flow fields (CHAR 3D) LANGLEY-11596 B74-10236 09 NOZZLE GEOMETRY Vented vectoring-nozzle for STOL and V/STOL aircraft ARC-10839 B74-10058 06 NOZZLE THRUST COEFFICIENTS Vented vectoring-nozzle for STOL and V/STOL aircraft ARC-10839 B74-10058 06 NUCLEAR AUXILIARY POWER UNITS Radioisotope heater ARC-10791 B74-10051 03 Economical technique for fragmentation testing ARC-10792 B74-10052 04 NUCLEAR ELECTRIC	Fast signal averager ARC-10090 PTICAL TRACKING Remote sunfall monitor: A concept M-FS-22943 PORGANIC COMPOUNDS Detection of cracks in surface insulation MSC-14187 Polymer compositions suitable for use in enriched oxygen atmospheres MSC-14618 Remote explosives MSC-10338 PORGANIC MATERIALS Polymer compositions suitable for use in enriched oxygen atmospheres MSC-14618 Remote explosives New tooth enamel from brushite crystals ERC-10338 B74-10199 PORGANIC NITRATES Negative ion spectrometry for detecting nitrated explosives NPO-13082 B74-10276 PORIENTATION Spacecraft attitude determination by fanscan technique ARC-10827 PORTHOPEDICS Therapeutic hand-exercising device with cycling pressure value LANGLEY-11579 B74-10140 B74-10140 B74-10140 B74-10140 B74-10140 B74-10140 B74-10140 B74-10140 B74-10140	P-TYPE SEMICONDUCTORS Efficiency increased in new solar cell: A Concept LANGLEY-11174 B74-10090 01 PACKAGING Toroidal equipment packaging ARC-10828 B74-10055 03 PACKING Color-coded area sensitivity maps of photomultipliers LANGLEY-10320 B74-10259 01 PANELS Laminating cored, stressed-face, sandwich structures XLA-11028 B74-10233 06 New insulation attachment method eliminates compatibility bondline stresses MSC-12615 B74-10269 07 PAPERS Polyelectrolytes with high charge density NPO-11918 B74-10159 04 Inspection of transparent surfaces using photosensitive paper MSC-19442 B74-10224 03 PARABOLIC ANTENNAS Variable-beamwidth antennas GSFC-11760 B74-10041 02 Bidirectional zoom antenna GSFC-11862 B74-10257 01

PARTICLE ACCELERATOR TARGETS	PHASE SHIFT	Explosive welding technique for joining
Long life neutron generator target using	Heart-rate pulse-shift detector	aluminum and steel tubes
deuterium pass-through structure	ARC-10729 B74-10196 01	MSC-14721 B74-10272 08
LEWIS-11866 B74-10063 03 A high yield neutron target	PHASED ARRAYS	PLANETARY ATMOSPHERES Extendible probe for atmosphere
LEWIS-12058 B74-10066 03	Phased-array antenna phase control circuit using frequency multiplication	Extendible probe for atmosphere sampling
PARTICLE DIFFUSION	ERC-10285 B74-10251 01	ARC-10829 B74-10054 03
Long life neutron generator target using	Amplitude-steered, pseudophased	Method for remotely sensing turbulence
deuterium pass-through structure	antenna array	of planetary atmospheres
LEWIS-11866 B74-10063 03	GSFC-11446 B74-10255 01	NPO-13154 B74-10168 03
PARTICLE INTERACTIONS	PHOSPHORYLATION	PLANETARY SURFACES
Methods for improved resolution of flow	Enzymatic regeneration of adenosine	Analysis of orbital heat transfer
electrophoresis cells M-FS-22223 B74-10032 04	triphosphate cofactor	ARC-10842 / B74-10115 02
PARTICLE MASS	ARC-10837 B74-10057 04	PLASMA DIAGNOSTICS
Particle impact location detector	PHOTOCONDUCTIVE CELLS	Wavelength-selective, sequential
GSFC-11829 B74-10230 03	Facility for testing solar cells NPO-11761 B74-10099 02	Q-switching laser cavity LANGLEY-11045 B74-10134 03
PARTICLE PRODUCTION	PHOTOGRAPHIC EQUIPMENT	PLASMA SPRAYING
Improved dispensing targets for ion beam	Vertical copy camera system provides	Plasma-sprayed metal-glass fluoride
particle generators	photographs from erts-1 imagery	coatings for lubrication to 1170 K (1650
NPO-13112 B74-10108 03	LEWIS-12140 B74-10009 07	F)
PARTICLE SIZE DISTRIBUTION Improved high volume air sampler	Viewgraph preparation made easier	LEWIS-11930 B74-10016 04
LEWIS-11644 B74-10080 05	LANGLEY-11612 B74-10094 03	PLASTICS
PARTICULATE SAMPLING	PHOTOGRAPHIC FILM	Plastic covering on airfoil structure
Improved high volume air sampler	Precision glasscutter	provides smooth uninterrupted surface
LEWIS-11644 B74-10080 05	LANGLEY-11604 B74-10031 07	MSC-12631 B74-10270 08
PEENING	Viewgraph preparation made easier	Apparatus for heat treating plastic belts
Mechanical rod peening	LANGLEY-11612 B74-10094 03	NPO-13205 B74-10299 02
M-FS-23047 B74-10237 07	Automatic marker for photographic film MSC-14705 B74-10152 03	PLATFORMS
PERFORMANCE PREDICTION Prediction of unsteady aerodynamic		Brake for rollable platform ARC-10512 B74-10045 06
loadings caused by trailing-edge	Vertical copy camera system provides	PLATING
control-surface motions in subsonic	photographs from erts-1 imagery	Fabrication of thick structures by
compressible flow	LEWIS-12140 B74-10009 07	sputtering
LANGLEY-11175 B74-10091 06	PHOTOGRAPHIC PROCESSING EQUIP-	LEWIS-12331 B74-10126 08
Computation of aerodynamic interference	MENT	PLOTTING
between lifting surfaces and lift- and	Precision glasscutter	 Generalized curve fit and plotting
cruise-fans ARC-10833 B74-10113 09	LANGLEY-11604 B74-10031 07 PHOTOGRAPHIC TRACKING	(GECAP) program
Reliability data for electronic and	Optical discriminator system	M-FS-22728 B74-10044 09
electromechanical components: A report	LANGLEY-11580 B74-10139 03	Computer program for calculating critica
NPO-13153 B74-10280 01	PHOTOMETERS	speeds of rotating shafts LEWIS-11910 B74-10128 09
Telecommunications systems design	Digital multichannel photometer	PNEUMATIC CIRCUITS
	UO 10701 B74 10000 00	FINEDWATIC CINCOTTS
techniques handbook	HQ-10791 B74-10200.03	Pulse-width-modulated servo valve for
NPO-13245 B74-10284 02	PHOTOMULTIPLIER TUBES	Pulse-width-modulated servo valve for autopilot system
NPO-13245 B74-10284 02 Thermoelastic analysis of solar cell arrays	PHOTOMULTIPLIER TUBES Digital multichannel photometer	Pulse-width-modulated servo valve for autopilot system LANGLEY-11643 B74-10179 06
NPO-13245 B74-10284 02 Thermoelastic analysis of solar cell arrays and their material properties	PHOTOMULTIPLIER TUBES Digital multichannel photometer HQ-10791 B74-10200 03	autopilot system
NPO-13245 B74-10284 02 Thermoelastic analysis of solar cell arrays and their material properties NPO-13458 B74-10301 03	PHOTOMULTIPLIER TUBES Digital multichannel photometer HQ-10791 B74-10200 03 Color-coded area sensitivity maps of	autopilot system LANGLEY-11643 B74-10179 06 PNEUMATIC EQUIPMENT Ignition of sounding rocket motors with
NPO-13245 B74-10284 02 Thermoelastic analysis of solar cell arrays and their material properties	PHOTOMULTIPLIER TUBES Digital multichannel photometer HQ-10791 B74-10200 03	autopilot system LANGLEY-11643 B74-10179 06 PNEUMATIC EQUIPMENT Ignition of sounding rocket motors with hand-pumped air
NPO-13245 B74-10284 02 Thermoelastic analysis of solar cell arrays and their material properties NPO-13458 B74-10301 03 PETROLOGY	PHOTOMULTIPLIER TUBES Digital multichannel photometer HQ-10791 B74-10200 03 Color-coded area sensitivity maps of photomultipliers	autopilot system LANGLEY-11643 B74-10179 06 PNEUMATIC EQUIPMENT Ignition of sounding rocket motors with hand-pumped air LANGLEY-11152 B74-10202 03
NPO-13245 B74-10284 02 Thermoelastic analysis of solar cell arrays and their material properties NPO-13458 B74-10301 03 PETROLOGY Improved dispensing targets for ion beam	PHOTOMULTIPLIER TUBES Digital multichannel photometer HQ-10791 B74-10200 03 Color-coded area sensitivity maps of photomultipliers LANGLEY-10320 B74-10259 01 PHOTOSENSITIVITY Inspection of transparent surfaces using	autopilot system LANGLEY-11643 B74-10179 06 PNEUMATIC EQUIPMENT Ignition of sounding rocket motors with hand-pumped air LANGLEY-11152 B74-10202 03 Mechanical rod peening
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NPO-13245 B74-10284 02 Thermoelastic analysis of solar cell arrays and their material properties NPO-13458 B74-10301 03 PETROLOGY Improved dispensing targets for ion beam particle generators NPO-13112 B74-10108 03 PHASE COHERENCE Amplitude-steered, pseudophased antenna array GSFC-11446 B74-10255 01 PHASE CONTROL Phased-array antenna phase control circuit using frequency multiplication ERC-10285 B74-10251 01 PHASE DETECTORS Frequency discriminator/phase detector NPO-11515 B74-10098 02 PHASE ERROR Stable group delay cable NPO-13138 B74-10295 01 PHASE LOCKED SYSTEMS Frequency discriminator/phase detector NPO-11515 B74-10098 02 Digital second-order phase-locked loop NPO-11905 B74-10274 01 PHASE MODULATION	PHOTOMULTIPLIER TUBES Digital multichannel photometer HQ-10791 B74-10200 03 Color-coded area sensitivity maps of photomultipliers LANGLEY-10320 B74-10259 01 PHOTOSENSITIVITY Inspection of transparent surfaces using photosensitive paper MSC-19442 B74-10224 03 PIEZOELECTRIC TRANSDUCERS Process to restore obliterated serial numbers on metal surfaces LEWIS-12085 B74-10020 07 Probe for measuring turbulent real-time shear-stress waves ARC-10755 B74-10072 03 Piezoelectric relay GSFC-11627 B74-10089 01 PIEZORESISTIVE TRANSDUCERS Low-temperture electrostatic silicon-to-silicon seals using sputtered borosilicate glass LANGLEY-11589 B74-10263 08 PINS Pocket gauge for checking insert clocking of multipin circular connectors NPO-11924 B74-10160 01	autopilot system LANGLEY-11643 B74-10179 06 PNEUMATIC EQUIPMENT Ignition of sounding rocket motors with hand-pumped air LANGLEY-11152 B74-10202 03 Mechanical rod peening M-FS-23047 B74-10237 07 POISSON RATIO Miniature biaxial strain transducer LANGLEY-11648 B74-10180 01 POLARIZED LIGHT Dynamic polarization compensating system for optical receiver GSFC-11782 B74-10182 03 POLARIZERS Field-sequential stereo television MSC-12616 B74-10223 03 POLICE Location of vehicles using AM station broadcasting signals NPO-13217 B74-10300 02 POLLUTION Combustion products generating and metering device GSFC-11095 B74-10036 04
NPO-13245 B74-10284 02 Thermoelastic analysis of solar cell arrays and their material properties NPO-13458 B74-10301 03 PETROLOGY Improved dispensing targets for ion beam particle generators NPO-13112 B74-10108 03 PHASE COHERENCE Amplitude-steered, pseudophased antenna array GSFC-11446 B74-10255 01 PHASE CONTROL Phased-array antenna phase control circuit using frequency multiplication ERC-10285 B74-10251 01 PHASE DETECTORS Frequency discriminator/phase detector NPO-11515 B74-10098 02 PHASE ERROR Stable group delay cable NPO-13138 B74-10295 01 PHASE LOCKED SYSTEMS Frequency discriminator/phase detector NPO-11515 B74-10098 02 Digital second-order phase-locked loop NPO-11905 B74-10274 01	PHOTOMULTIPLIER TUBES Digital multichannel photometer HQ-10791 B74-10200 03 Color-coded area sensitivity maps of photomultipliers LANGLEY-10320 B74-10259 01 PHOTOSENSITIVITY Inspection of transparent surfaces using photosensitive paper MSC-19442 B74-10224 03 PIEZOELECTRIC TRANSDUCERS Process to restore obliterated serial numbers on metal surfaces LEWIS-12085 B74-10020 07 Probe for measuring turbulent real-time shear-stress waves ARC-10755 B74-10072 03 Piezoelectric relay GSFC-11627 B74-10089 01 PIEZORESISTIVE TRANSDUCERS Low-temperture electrostatic silicon-to-silicon seals using sputtered borosilicate glass LANGLEY-11589 B74-10263 08 PINS Pocket gauge for checking insert clocking of multipin circular connectors NPO-11924 B74-10160 01 PIPES (TUBES) Modular support blocks for fluid lines	autopilot system LANGLEY-11643 PNEUMATIC EQUIPMENT Ignition of sounding rocket motors with hand-pumped air LANGLEY-11152 Mechanical rod peening M-FS-23047 POISSON RATIO Miniature biaxial strain transducer LANGLEY-11648 POLARIZED LIGHT Dynamic polarization compensating system for optical receiver GSFC-11782 POLARIZERS Field-sequential stereo television MSC-12616 POLICE Location of vehicles using AM station broadcasting signals NPO-13217 POLLUTION Combustion products generating and metering device GSFC-11095 POLYIMIDE RESINS
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Polymer compositions suitable for use	PRESSURE BREATHING	PROPULSION SYSTEM PERFORMANCE
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MSC-14618 B74-10154 04	positive-pressure breathing system	three-dimensional supersonic exhaust flow
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MSC-14331 B74-10157 04 Polyelectrolytes with high charge	PRESSURE REGULATORS Design criteria monograph for pressure	LANGLEY-11596 B74-10236 09
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NPO-11918 874-10159 04	disks, and explosive valves	KSC-10833 B74-10183 05
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A concept	Programmed-pressure air supply for positive-pressure breathing system	Plasma-sprayed metal-glass fluoride
NPO-11609 B74-10210 05 POLYMERIZATION	ARC-10845 B74-10075 05	coatings for lubrication to 1170 K (1650
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by dianhydrides	components	Detection of cracks in surface
NPO-13046 B74-10077 04	LEWIS-12327 B74-10087 06	insulation
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ARC-10779 B74-10073 04	PRESSURE SENSORS	tanks
POLYTETRAFLUOROETHYLENE Volume-reflecting dielectric heat shield	Electronic high pass filter LEWIS-11600 B74-10083 02	ARC-10861 B74-10219 04
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ARC-10861 B74-10219 04	vessel	Apparatus for heat treating plastic belts
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KATSANIS, T.	NPO-13201 B74-10298 07	emission current
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KATZBERG, S. J. Viewgraph preparation made easier	Amplitude-steered, pseudophased an-	LESCO, D. J.
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